

MANUAL OF DIRECTIONS

FOR THE EMPLOYMENT OF

INJECTIONS IN VARIOUS DISEASES,

WITH REMARKS UPON THE NATURE AND TREATMENT
OF HABITUAL CONSTIPATION;

PRECEDED BY A

TREATISE ON THE INTESTINAL CANAL,

ITS STRUCTURE, FUNCTIONS, ETC., WITH A DESCRIPTION
OF THE DIGESTIVE PROCESS.

By M. MATTSON, M. D.,

FELLOW OF THE MASSACHUSETTS MEDICAL SOCIETY, MEMBER
OF THE BOSTON MEDICAL ASSOCIATION, ETC.

For the good of the afflicted, we hope that enemas will be looked upon as indispensable medical as well as domestic remedies. — PROFESSOR DEWERS.

SIXTH THOUSAND.

BOSTON:

PRINTED FOR THE AUTHOR,

TO ACCOMPANY HIS IMPROVED FAMILY SYRINGES OR
INJECTING INSTRUMENTS.

1856.



CIVIL
1856

MANUAL OF INSTRUCTIONS

FOR THE USE OF THE

OFFICE OF THE SECRETARY OF THE ARMY

AND THE OFFICE OF THE SECRETARY OF THE NAVY

OF THE UNITED STATES OF AMERICA

BY THE SECRETARY OF THE ARMY

AND THE SECRETARY OF THE NAVY

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MORRIS MATTSON,
in the Clerk's Office of the District Court of Massachusetts.

RIVERSIDE, CAMBRIDGE :
STEREOTYPED AND PRINTED BY
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PREFACE TO THE SECOND EDITION.

SINCE the publication of our first edition, we have introduced a modified form of Syringe, termed the *Pocket Injecting Instrument*, which name we have selected merely to indicate that it is portable, and may be carried conveniently in the pocket. It is considered a desirable improvement upon the *Family Syringe*, so termed, which we originally introduced, and which was so highly recommended by many eminent physicians, as Dr. John C. Warren, of Boston, and Dr. Valentine Mott, of New York. The Pocket Instrument is ready for use at any moment, without the trouble of adjusting a single screw, and is not liable to get out of order. It enables the individual to inject any desirable quantity of fluid without interruption, and is preëminently superior as a "SELF-SYRINGE," inasmuch as the piston may be worked with one hand, thereby leaving the other hand free to hold the terminal tube. The two objections which were occasionally urged against

the Family Syringe, namely, that it was not as portable as could be desired, and that only a limited quantity of fluid could be injected without stopping to refill the barrel, have been obviated in the Pocket Instrument, and we are gratified in being able to state that it has been received with the highest mark of favor by our professional brethren, as well as by an intelligent and discerning public.

Among the additions which will be found in our reprint, is one in relation to *injections of nitrate of silver*, which physicians have proved to be highly efficacious in many cases of intestinal disease.

Boston, February, 1854.

PREFACE TO THE FIRST EDITION.

THE necessity that existed for a new injecting instrument which might be used with convenience and facility by women suffering with leucorrhœa, induced us to exercise what little ingenuity we possessed in supplying this want; and the result of our labors has been what we term the *Improved Family Syringe*, which is now before the public.

The *Manual of Directions*, which is here presented to the reader as an accompaniment of the syringe, was written from a conviction that such a guide was needed by the community; and if Dr. Dewees, whom we have quoted in our motto, is correct in asserting that injections should be regarded as *indispensable domestic remedies*, then it is important that the people should be made acquainted, to some extent at least, with the rules and principles which govern their employment.

The subject of injections cannot be clearly or definitely understood, without a knowledge of the structure of the

intestinal canal, and we have been at some pains, therefore, to procure an appropriate illustration, which will be found in another part of the work, (p. 25,) and which will enable the reader, in connection with the explanation which accompanies it, to comprehend the whole subject, in its general outlines, without the slightest difficulty. We may add, that the few *technical* terms which we have been obliged to use, have been accompanied by explanations which will render them intelligible to the non-professional reader.

As physiology is now taught to the little children in our schools — and may God bless this effort of the intelligent New England people — we do not deem it necessary to offer an apology for this humble attempt to instruct the “children of larger growth” in a special branch of physiology, which is intimately associated with the study and preservation of health, and which, unfortunately, has been too long neglected.

We have made free use of the philosophical and deeply interesting treatise of Dr. O’Beirne on Defecation, etc., because the work, so far as we know, and for some unaccountable reason, is entirely out of print, and because, moreover, we felt persuaded that the subject, in its present relation, would be likely to interest the medical profession. The authority of Dr. O’Beirne, let me add, is not to be lightly questioned, for we find him quoted by many distinguished authors, as Dr. Carpenter in his *Physiology*, and Professor Wood in his *Practice of Medicine*.

We must address a word or two, before we close, to the advocates of the homœopathic and hydropathic systems, who have already purchased our instrument to a considerable extent. It is well known that they do not, as a general thing, make use of medicinal injections, although they employ injections of warm and cold water very freely. Now, so far as we are concerned individually, we confess that we have some confidence in the use of medicines, when employed judiciously, although we are free to acknowledge that they are greatly abused by the public, who swallow drugs with about the same appetite that they swallow beef steak and pudding; but apart from any choice of our own in the matter, we felt obliged to introduce medicinal formulas into our book, because we knew that they would be required by a large mass of our readers and patrons. We trust, therefore, that this fact will not be regarded by the homœopaths or hydropaths, who may purchase our instrument, as any evidence that we wish to interfere, in the slightest degree, with their peculiar views of the healing art. We claim the privilege of enjoying our own opinions, untrammelled, and we are quite willing to concede this privilege to others. Those who find, by experience, that injections of warm or cold water are sufficiently active and efficient—and they answer every purpose in a large number of cases—will not trouble themselves about medicinal injections, nor care a fraction whether we have recommended them in our book or not; and all we ask in behalf of our

patrons—including, as they do, the advocates of every system of practice—is, that each one shall have the privilege of acting in accordance with “the light which he has received,” or in obedience to the dictates of his experience and judgment.

We claim nothing for our little work on the score of originality, excepting that it is the first messenger of the kind, so far as we know, which has been sent forth into the world upon an errand of mercy. We have made the best use of our limited time to present it in as condensed and systematic a form as possible, and though it may be very imperfect in its character, yet it is probably better than no book at all. Like all works which have been hurriedly written, it no doubt contains its share of verbal inaccuracies, but the generous reader, we are sure, will pass these over in a kindly spirit.

BOSTON, July, 1852.

DIRECTIONS TO THE READER.

The few technical terms employed, will be found in the Index, accompanied with a reference to the paragraphs or notes in which they are explained.

ABBREVIATIONS. Par. for paragraph ; p. for page.

CONTENTS.

PART I.

	PAGE.
Preface to the Second Edition.	iii
Preface to the First Edition	v
Pelvis or Basin, ...	13
Abdomen and Abdominal Regions, ...	17
Alimentary Canal, ...	22
Stomach, ...	22
Intestines, ...	23
Structure of the Intestines, ...	29
Relation of the Intestines to other Organs, ...	30
Intestinal Fluid, ...	32
Digestion — Functions of the Intestines, ...	34
Feces or Excrementitious Matters of the Intestines, ...	39
Where do the Feces Accumulate?	46
Flatulence — Gases of the Stomach, Intestines, etc., ...	54

PART II.

Use and Value of Injections, ...	63
Opinions of Authors, ...	65
Improved Family Syringes or Injecting Instruments, ...	68
Abbreviations, Weights, and Measures, ...	69

Infusion and Decoction, ...	71
Quantity of Fluid for an Injection, ...	71
Temperature of Injections, ...	73
Directions for taking Injections, ...	75
Cleansing the Syringe, ...	78
Formulas for Injections, ...	80
Large Injections, ...	110
Large Injections Continued — Rectum Tube, ...	114
Cases treated by Dr. O'Beirne, ...	118
Dysentery in India, ...	128
Diarrhoea and Constipation, ...	132
Cold Water Injections, ...	133
Vaginal Injections, ...	138

ILLUSTRATIONS.

Pelvis or Basin, ...	15
Abdominal Regions, ...	19
Gall-Bladder, Stomach, and Intestines, ...	25
Organs within the Female Pelvis, ...	139

PART I.

INTESTINAL CANAL,—ITS STRUCTURE, FUNCTIONS, ETC.

PELVIS OR BASIN.

1. THE pelvis is a bony structure at the lower part of the abdomen, forming the base of the spine or backbone, and is so named from a Greek word signifying basin, because it resembles a basin which was used in former times.

2. We have no particular desire to trouble the reader with anatomical descriptions, but we are obliged, nevertheless, to say a word or two of the pelvis, inasmuch as it comprises certain "landmarks" which are important in reference to what we have to say presently of the "abdominal regions," and inasmuch, also, as its cavity constitutes the inferior portion of the great abdominal cavity, which will require at least a passing notice, in order to render our subject intelligible to the non-professional reader.

Explanation of the Plate.—See opposite page.

3. *A.* Prominence which may be felt at either side of the abdomen, two or three inches above the bend of the thigh, constituting a portion of what is termed in common phrase the *hip bone*. Anatomists call it the *anterior superior spinous process of the ilium*.

4. *B.* Termination of the spine or vertebral column, which may be felt an inch or an inch and a half behind the anus, termed the *coccyx*, from its resemblance to the beak of a cuckoo.

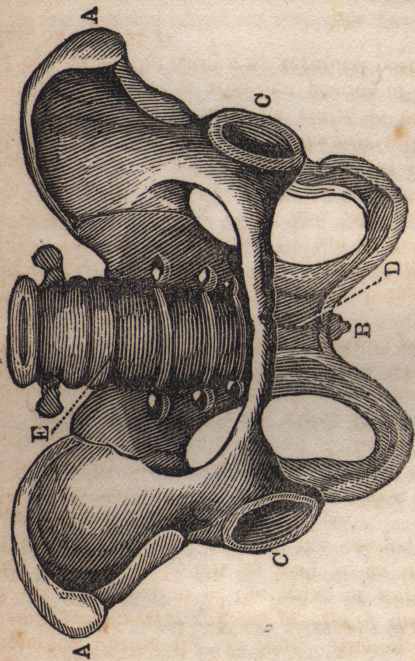
5. *C.* Acetabulum, signifying a saucer, being the cup-like cavity or socket, on either side of the pelvis, which receives the rounded head of the thigh bone.

6. *D.* Pubis or front bone, which forms the lower boundary, externally, of the abdomen or belly. The pubis, in truth, consists of two bones, which unite and form what is termed the *symphysis pubis*, indicated by *D*.

7. *E.* Promontory of the sacrum, being a somewhat projecting portion of the spinal column, at this point. The line represented by the darker shade in the engraving, passing right and left from *E*, and forming a continuous line with the top of the pubis, constitutes the upper edge or *brim* of the pelvis. Below this line is the *cavity of the pelvis*, the inferior portion of which, termed its *outlet*, is bounded in front by the lower or arch-like portion of the pubis, and behind by the coccyx or terminal portion of the spine, as seen at *B*.

8. We may remark, in passing,—for we wish to render this little treatise as useful as possible to the fairer portion of our readers,—that childbirth is some-

PLATE I.



PELVIS OR BASIN.

For explanation of the Plate, see opposite page.

times rendered tedious by deformity of the pelvis, which is produced by rickets during childhood, or which may occur in adult age from the softening of the bones. The pelvis may be so much distorted as to render delivery impossible, but this is a rare occurrence; and where there is extensive deformity, the female is generally aware of the fact, or has every reason to suspect it, and will therefore prudently refrain from matrimony. It often happens, however, that a woman is deformed in the back and limbs, and yet is perfect with regard to the pelvis, so that this should be taken into the account when a question arises as to the propriety of entering the married state.

ABDOMEN AND ABDOMINAL REGIONS.

9. The trunk of the body is divided into two great cavities, the upper one being the *chest* or *thorax*, and the lower one the *abdomen*, signifying to hide or conceal.

10. The abdomen is bounded above by the diaphragm or midriff, (plate II., p. 19,) which separates it from the chest; behind by the spine or vertebral column; below by the bony structure called the pelvis or basin, already described.

11. In the *male*, the abdomen contains the liver, spleen, pancreas, stomach, intestines, bladder, and kidneys; in the *female*, it contains, in addition to these organs, the uterus or womb, with its appendages.

12. Strictly speaking, the pelvis has a cavity of its own, which is the lower or inferior portion of the great abdominal cavity, as already mentioned, and in the *male*, the pelvic cavity contains the bladder,

prostate gland and rectum, while in the *female* it contains the bladder, vagina, uterus, and rectum.

13. ABDOMINAL REGIONS. Anatomists long ago divided the abdomen into a number of regions, designating each by a particular name, thereby enabling physicians to describe the exact locality of a particular pain or disease in the abdominal cavity, which it would be impossible to do without such division. The subjoined explanation will render the subject clear to the non-professional reader.

Explanation of the Plate.—See opposite page.

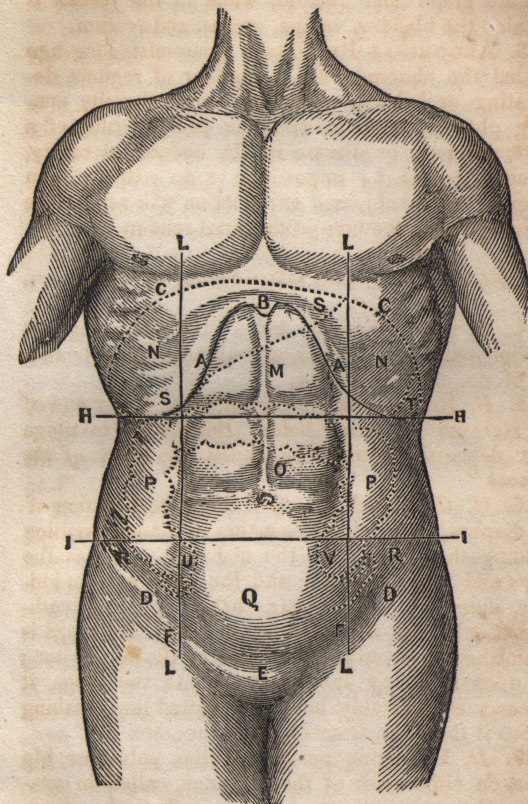
14. *A, A.* Continuous black line, showing the inferior margin of the ribs, and also the lower boundary of the chest or thorax.

15. *B.* Ensiform cartilage, being the lower end of the sternum or breast bone. Below this cartilage is a depression familiarly called the "*pit of the stomach.*"

16. *C, C.* Dotted line, indicating the situation of the diaphragm or midriff—a thin muscular partition dividing the chest from the abdomen. It has the lungs and heart above it, and the liver, spleen, kidneys, stomach, intestines, etc., below it. In breathing out, whereby the quantity of air in the lungs is diminished, it is convex, as shown by the dotted line; but upon inspiring or taking air into the lungs, it descends considerably below the dotted line, pushing before it the liver, stomach, intestines, etc.

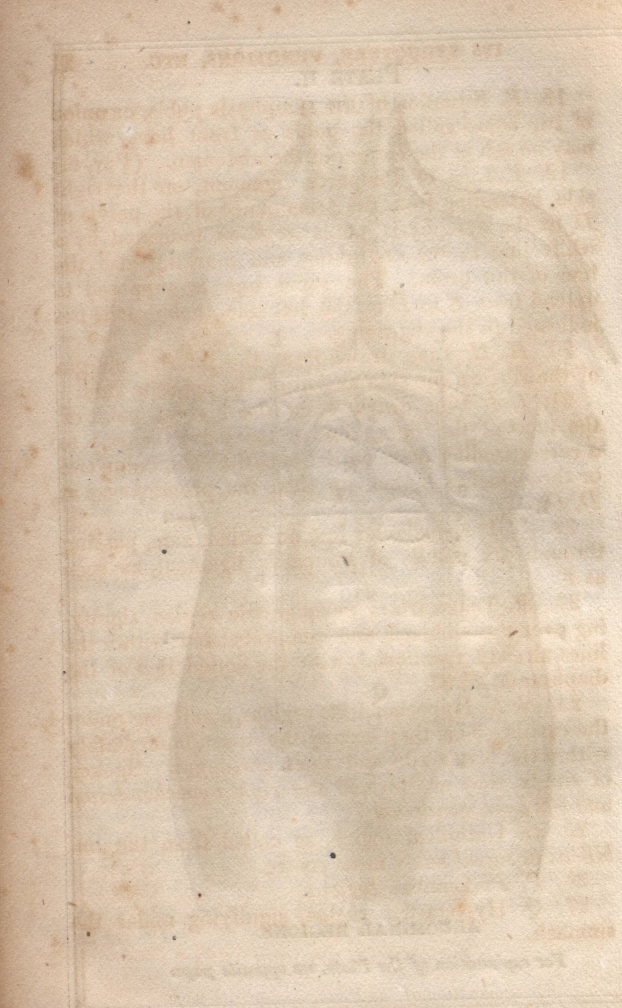
17. *D.* Projecting portion of the pelvis or hip bone, on either side of the abdomen, called in anatomy the *anterior superior spine of the ilium.* (Par. 3.)

PLATE II.



ABDOMINAL REGIONS.

For explanation of the Plate, see opposite page.



18. *E*. Situation of the symphysis pubis, or union of two bones called the pubis or front bone, which may be felt at the bottom of the abdomen. (Par. 6.)

19. *F*. Line of Poupart's ligament, on the right side, extending from the prominence of the pelvis at *D*, to the symphysis pubis at *E*, as indicated by a white line in the engraving, and marking also the line of the groin. The same line is supposed to extend from *E* to *D* on the left side, though it is not indicated in the engraving.

20. *H*, *H*. Line drawn from the inferior margin of the ribs on one side to that of the opposite side.

21. *I*, *I*. Line drawn from the highest point of the crest of the ilium, (one of the pelvic bones,) to a corresponding point on the opposite side, being two or three inches higher up than the prominences at *D*, *D*.

22. *L*. Perpendicular line on either side, passing through the middle of Poupart's ligament, as seen at *F*.

23. *M*. Epigastrium or epigastric region, signifying over the stomach, and comprehended within the lines already mentioned, with the dotted line of the diaphragm, *C*, *C*.

24. *N*, *N*. Hypochondriac regions, signifying under the cartilages, as they occupy the space immediately within the lower ribs and their cartilages. Spoken of singly, they are termed the *right hypochondrium* and *left hypochondrium*.

25. *O*. Umbilical region, so called from the *umbilicus* or *naval* being in its centre.

26. *P*, *P*. Lumbar regions.

27. *Q*. Hypogastric region, signifying under the stomach.

28. *R, R.* Iliac regions. The term *inguinal region* is sometimes applied to the vicinity of Poupert's ligament, *F*, which is the region of the groin.

29. *S, S.* Situation or region of the liver, comprehended within the dotted line *S*, a portion of the dotted line *C, C*, and portions of the black lines *A* and *H*.

30. *T.* Situation of the spleen.

31. *U.* Situation of the cœcum, shown by dotted lines, with the ascending, transverse, and descending colon, terminating in the sigmoid flexure of the colon.

32. *V.* Situation of the sigmoid flexure.

ALIMENTARY CANAL.

33. This term is applied to the tube which extends from the mouth to the anus, comprehending in its course the pharynx, (throat,) œsophagus or gullet, and the stomach and intestines.

STOMACH.

See Illustration, Plate III., Page 25.

34. The stomach is a membranous sac or bag, situated in the upper part of the abdominal cavity. Its larger extremity is contained in the left hypochondriac region, from which it extends into the epigastrium. (Plate II., page 19.) It lies beneath the diaphragm and liver, and is separated from the small intestines by the transverse colon. Its left extremity is in connection with the spleen. It has two curvatures, the lesser of which, *D*, is in relation with the pancreas, a portion of the duodenum, and left kidney.

The greater curvature, *E*, when the organ is distended with food, forms the rounded outline of the abdomen.

35. The stomach has two orifices, the *cardiac* or *upper*, *B*, formed by the termination of the œsophagus or gullet, and the *pyloric* or *intestinal*, *C*, formed by its connection with the duodenum. There is a valve or circular fold of mucous membrane at *C*, constituting what is termed the *pylorus*, from a Greek word signifying *gate-keeper*, because it does not allow of the ready passage of the undigested food.

36. Moderately distended, the stomach, in the adult male, is capable of holding about three pints. In an infant, at birth, its size does not exceed that of a hen's egg, and hence is very easily overloaded by indulgent and anxious mothers.

37. The stomach has an external, serous, or peritoneal coat, a middle or muscular coat, and an internal or mucous coat. The first is a firm, shining membrane, which not only covers the stomach and intestines, but also lines the abdominal cavity. The second is composed of fleshy fibres, one layer of which is longitudinal, and the other transverse or circular. The third or internal coat, is a soft, velvety membrane, of a pale, pink color in health, but red when inflamed. Having larger dimensions than the other two coats, it is thrown into folds or wrinkles when the stomach is empty.

INTESTINES.

See Illustration, Plate III., Page 25.

38. The intestines commence at the pyloric orifice

of the stomach, and terminate at the anus. Their length in the adult is about thirty feet, being six or seven times longer than the body. They are divided into *small* and *large*.

39. SMALL INTESTINES. These are formed by a continuous tube, but are nevertheless arbitrarily divided into three portions, namely, the *duodenum*, *jejunum*, and *ilium*.

40. The *duodenum* is about a foot long, and commences at the pyloric orifice of the stomach. It was thus named because its length is about equal to the breadth of twelve fingers. It descends from the pylorus, and then passes transversely from right to left, and finally loses itself behind the transverse arch of the colon, where it unites with the commencing portion of the jejunum, as seen at *G*. It is larger than any other of the small intestines, and hence has been termed a secondary stomach. The biliary and pancreatic ducts, the latter of which is seen at *W*, perforate it three or four inches from the pylorus,

Explanation of Plate III. See opposite page. *A.* Stomach. *B.* Its cardiac or upper orifice, *C.* Its pyloric or intestinal orifice. *D.* and *E.* Lesser and greater curvatures of the Stomach. *F.* Duodenum. *G.* Commencement of the jejunum. *H, H.* Continuation of the jejunum. *I, I.* Ilium. *J.* Termination of the ilium in the cœcum. *K.* Cœcum. *L.* Appendix cœci. *M.* Ascending colon. *N.* Transverse or horizontal colon. *O.* Descending colon. *P.* Sigmoid flexure of the colon. *Q.* Rectum, widening as it descends, and forming a pouch at *X*. *R.* Anus or fundament. *S.* Gall-bladder. *T.* Cystic duct. *U.* Common hepatic duct, formed by the right and left hepatic ducts, proceeding from the liver. *V.* Ductus communis choledochus or common duct, passing behind the duodenum, in which it terminates. *W.* Pancreatic duct, also terminating in the duodenum. *X.* Pouch of the rectum.

PLATE III.



GALL-BLADDER, STOMACH, AND INTESTINES.

*For explanation of Plate, see opposite page ; also Stomach, p. 22,
and Intestines, p. 23.*

and through these facts is shown the full and
complete history of the University of Chicago
from its origin to the present time. The book
is written in a clear and concise style, and
contains a wealth of interesting facts and
figures. It is a valuable addition to the
literature of the University of Chicago, and
is highly recommended to all who are
interested in the history of the University.

and through these ducts it receives the bile and pancreatic juice.

41. The *jejunum*, *H*, *H*, is continuous with the duodenum, and is first seen at *G*, as it passes down behind the transverse colon. It is thus named because it is usually found empty. Its length is eleven or twelve feet,

42. The *ilium*, *I*, *I*, comprises the remaining three fifths of the small intestines, and consequently is seventeen or eighteen feet long. Its name is significant of its numerous windings or convolutions. It is smaller in size than the jejunum, but there is nothing to indicate the termination of the one, nor the commencement of the other. It forms a junction with the cœcum at *J*, at which point is situated a valve termed the *ileo cœcal valve*, which allows the contents of the ilium to pass freely into the cœcum, but ordinarily prevents any return of the same into the ilium.

43. The jejunum and ilium, it will be observed, are completely surrounded by the large intestines.

44. LARGE INTESTINES. These are five or six feet in length, and are divided into three portions, consisting of the *cœcum*, *colon*, and *rectum*. The cœcum and colon present a sacculated appearance, occasioned by three ribbon-like bands of muscular fibres which traverse them longitudinally, as shown in the illustration.

45. The *cœcum*, *K*, (from cœcus, blind,) is the commencement of the large intestines, and is about three inches in length, and the same in diameter. The ilium enters it at *J*, as already mentioned. Connected with its lower extremity is the *appendix vermiformis*, *L*, so called from its resemblance to an

earth worm. It is also termed the *appendix cæci*. The length of this appendix varies from one to five or six inches, and is about equal to a goose quill in diameter. The cœcum is situated at the lower part of the abdomen, on the right side, occupying the right iliac region, where it is tied down so as to be unable to change its position.

46. The colon, *M, N, O*, is a continuation of the cœcum, and is divided into the *ascending, transverse, and descending* colon. The first is seen at *M*, the second at *N*, and the third at *O*. The descending colon, in its termination, makes a remarkable double curve, resembling the letter S, and hence has been termed the *sigmoid flexure*. (See letter *P*.) The colon, on examination after death, is usually found empty.

47. The *Rectum, Q*, is a continuation of the sigmoid flexure, being the terminal portion of the large intestines, and is seven or eight inches in length. It differs from the colon in not being sacculated. In its descent it forms a double curve, passing in the first place somewhat horizontally from left to right, and then making a downward sweep in correspondence with the concavity of the sacrum, (see page 139, plate IV., letter *G*,) terminates finally in the contracted orifice forming the anus.

48. It will be seen that the rectum widens in its progress downward, until it forms a pouch-like expansion, (*X*), which varies in size in different individuals. This pouch may be reached by introducing the finger through the anus to the height of about two inches, where it may be moved about freely, but a little higher up resistance is encountered, which is owing to the rectum, immediately above the pouch, accord-

ing to the authority of Dr. O'Beirne, being at all times firmly contracted and perfectly empty, excepting a few minutes previous to the evacuation of the bowels. In the mean time the pouch itself, and the sigmoid flexure, are always more or less open and pervious. The pouch is capable of holding about two ounces (half a gill) of fluid, and therefore in the administration of an injection, which greatly exceeds this quantity, more or less injecting force is required to overcome the constriction of the rectum above the pouch before the fluid can be freely discharged from the syringe.

49. The *anus* or *fundament*, which terminates the rectum, is represented at *R*, being surrounded by a muscle called the *sphincter ani*, which, when it contracts, shuts the aperture through it into the rectum; and rising from it, as it were, are shown the muscles known as the *levatores ani*, which surround the extremity of the rectum, and serve to pull it upward after an evacuation of the bowels.

STRUCTURE OF THE INTESTINES.

50. Without going into minutiae, which would not be likely to interest the non-professional reader, we may remark that the structure of the intestines is nearly similar to that of the stomach, already described, having, in common with that organ, three coats or layers of membrane, the *external*, *serous*, or *peritoneal*, the *middle* or *muscular*, and the *internal* or *mucous*. The muscular coat, as in the stomach, (par. 37,) consists of two sets of fibres, the one longitudinal, and the other circular. These, by their alternate contraction and relaxation, produce the *vermicular*

or *peristaltic motion* which may be observed by looking into the abdomen of a newly killed animal. The longitudinal fibres shorten the intestines, and give rise to a motion similar to that of the creeping of a worm, and hence the term *vermicular*, from a Latin word signifying *worm*. The office of the circular fibres is to diminish the diameter of the intestines, and by contracting from above downward, in concert with the longitudinal fibres, they push the contents of the bowels onward towards the anus. Sometimes, however, this motion is inverted, as in severe cases of colic, and the contents of the intestines are forced upward instead of downward, until at length fecal or excrementitious matter is ejected by vomiting, constituting the disease termed *iliac passion*.

51. We have already noticed the peculiarity of the muscular coat of the colon, by which it is made to assume a sacculated appearance. (Par. 44.)

RELATION OF THE INTESTINES TO OTHER ORGANS.

52. Commencing with the duodenum, (plate III., p. 25,) we find that it is in relation with the liver, gall-bladder, transverse colon, right kidney, and pancreas.* It receives the ductus communis choledochus and pancreatic duct, as already stated. After death, it becomes discolored with bile, from its contiguity with the gall-bladder.

* The pancreas or sweet bread is a glandular body, resembling the tongue of a dog in shape. It lies across the spine, behind the stomach, in the left hypochondriac and epigastric regions, (plate II., p. 19,) and is in contact at its smaller extremity with the spleen. It secretes a fluid similar to the saliva, which aids in the digestive process.

53. The relations of the small intestines do not require particular notice.

54. The colon has extensive and important relations. Its ascending portion passes in front of the right kidney, and continuing across the cavity of the abdomen under the larger curvature of the stomach, the right portion of its transverse arch comes in contact with the liver and gall-bladder, and like the duodenum, is frequently found after death discolored with bile. The remainder of the arch, besides its obvious relations to the stomach and small intestines, is in relation also with the spleen.* The descending colon passes in front of the left kidney, and has similar relations with those of the ascending colon; but is situated more deeply in the abdominal cavity than the ascending colon.

55. The rectum possesses very great interest in respect to its relations, for as it descends into the pelvic cavity, it has the bladder and prostate gland in front of it in the male, and the womb and vagina in the female, the two latter being interposed between the rectum and bladder. These relations require to be kept strictly in view, as well as accurately studied, in treating the diseases of the rectum, bladder, womb, etc., and hence the importance of seeking aid from intelligent and educated physicians, rather than the boastful pretenders who know nothing of the structure or functions of the numerous organs belonging to the human body.

* The spleen is a soft, spongy body, about four inches in length, situated above the left kidney, and connected with the left extremity of the stomach. It has no excretory duct, and its use is not precisely known.

INTESTINAL FLUID.

56. The small intestines, according to Simon, when empty and not irritated, secrete an almost neutral, very viscid fluid; but during digestion, or when irritated, the secretion becomes decidedly acid. This fluid cannot be examined in a state of purity, but it is thought to be similar in constitution to the gastric juice, which will be noticed presently. It possesses the property of acting on those substances which have escaped the solvent power of the gastric juice. The intestinal fluid is necessarily more or less modified by its admixture with the pancreatic juice and bile, which are poured into the duodenum, as already mentioned. (Par. 40.)

57. The quantity of healthy intestinal fluid formed in twenty-four hours, was estimated by Haller, an old but not discarded authority, at *eight pints*. This may be an over estimate, but nevertheless, if the quantity formed be only half, or even a fourth of that specified by Haller, it is easy to perceive the injurious influence which would ensue from the fluid becoming highly acid. It is surprising to what an extent acid is sometimes generated in the stomach and intestines. Patients are met with occasionally, particularly those with chronic ailments, who are perfect laboratories for the generation of acid. We find an excessively acid state of the intestinal fluid in a variety of diseases, as dyspepsia, gout, rheumatism, etc. Dr. Bennett, of Edinburgh, asserts that an excess of acid in the alimentary canal, is the great peculiarity of consumption. Dr. Wachtl, of Vienna, found the excretions of the stomach in hooping cough, after the febrile action had subsided, so intensely acid as to excoriate

the throat and roughen the teeth. A dose of dilute muriatic acid could not, he said, have proved more acrid or injurious. Emetics, he contended, only afforded temporary relief by ridding the stomach for a time of its acid secretions, which, however, would soon return. It has been truly remarked by Simon, in his *Chemistry of Man*, already quoted, that it is by no means rare to meet with an excessive formation of acid both in the stomach and intestines, especially in children, as is indicated by acid eructations, a sour breath, and frequent greenish stools. He refers these symptoms to a morbid digestion, which he believes to originate in an excessively acid condition of the stomach and intestines, and in the consequent rapid production of lactic and acetic acids from vegetables and milk.

58. Acid forming copiously in the stomach, and passing into the intestines, is a frequent source of diarrhoea, dysentery, intestinal pain, and other sufferings. The acid of the stomach, however, in a greater or lesser degree, is undergoing almost constant absorption, and making its way to the kidneys for elimination from the body, increasing thereby the natural or healthful acidity of the urine; and it is a curious, as well as an important fact, made known to us, if we mistake not, by Dr. Bence Jones, that the acidity of the stomach, which is constantly varying, even in health, bears a fixed relation to the acidity of the urine; that is, when the stomach is the most acid, there is a diminution of acid in the urine, and *vice versa*; and it also appears that the urine manifests the highest degree of acidity just before each meal, when of course the stomach is the least acid. The greatest diminution of acidity in the urine seems to

be three hours after breakfast, from which time it constantly increases up to the period of taking food.

59. These brief remarks upon the intestinal fluid, will not, we hope, be considered unimportant, for it is well to bear in mind that this fluid, in health, is nearly neutral, or at best only slightly acid, and that from various causes it is prone to become excessively acid; and this acidity unquestionably plays an important part in the diseased actions of the system. Hence, the whole subject suggests numerous considerations with regard to remedies and treatment, and especially with regard to food and drink, teaching the people most emphatically to avoid those aliments and drinks which they find from experience to occasion acidity, and with it the whole round of dyspeptic troubles and difficulties.

DIGESTION — FUNCTIONS OF THE INTESTINES.

60. We must say something of the digestive process, because it bears a close relation to the physiology of the intestinal canal; and, first of all, we will briefly notice three agents which play an important part in this process, namely, the *gastric juice*, *bile*, and *pancreatic juice*.

61. The *gastric juice* is secreted by the stomach, and chiefly upon the introduction of food into that organ. It is of a yellow color, varying somewhat in its composition, but containing in health a certain proportion of muriatic, acetic, and lactic acids, and consequently having an acid taste. Along with these acids is an organic compound, named *pepsin*, which is the most important constituent of the gastric juice, as it is this agent which has the power of acting upon

and dissolving the food in the stomach, which is the first step in the digestive process.

62. The *bile* is a yellow, bitter, alkaline fluid, secreted by the liver, and emptied through a duct into the duodenum, as previously mentioned. (Par. 40.) Exposed to the air, it changes from a yellow to a green. The part which it plays in the digestive process, is not exactly settled, but it is thought to aid in the conversion of *chyme* into *chyle*. It also imparts more or less of a yellow color to the stools or feces, and is regarded as a natural, healthful stimulant of the bowels. It is not now conceded, as formerly, that it has any action upon the fatty or oily portion of the food, which it was supposed to change into an emulsion, and thereby render it fit for absorption into the blood.

63. It may be proper here to remark that the bile is not intended for admission into the stomach; but by an inverted peristaltic action of the duodenum, into which it is first emptied, it is sometimes forced upward into the stomach. In vomiting, therefore, it occasionally flows into this organ, and it is not unusual, in the administration of an emetic, to find the patient, after he has vomited for some time, bringing up a quantity of bile. In addition to this, we have the authority of Dr. Beaumont for believing that the bile is prone to find its way into the stomach as the result of an excessive indulgence in oily or greasy aliment.

64. The *pancreatic juice* is usually described as being identical, or nearly so, with the saliva. It gains admission into the duodenum simultaneously with the bile, each fluid having a duct or canal which perforates the intestine at the same point. (Par. 40.) The office of the pancreatic juice in the digestive pro-

cess, has received new light from the investigations and experiments of M. Bernard, who contends that physiologists are in error in supposing that the bile has any action in the solution or digestion of fatty matters, and that this property belongs exclusively to the pancreatic juice. He made a mixture of butter, or other oily matter, with pancreatic juice, and exposed it to a temperature of about 100 degrees, and found that the fatty particles underwent a peculiar change, becoming converted into a complete emulsion, having a creamy consistence, and a white color, very much resembling *chyle*. He tried the action of bile, saliva, and gastric juice, in a similar manner, but neither of them exercised any influence upon the fatty substances. The emulsion thus formed, as described above, is thereby fitted to be taken up by the lacteal or absorbent vessels of the intestines, and carried into the circulation for the nutrition of the body. Thus it would appear that the pancreatic juice is a special, if not the only solvent, of the fatty or oily matters which we employ as food, and that without its agency all greasy substances would be incompatible with the digestive process.

65. M. Bernard believes that his views are confirmed by the peculiar use which he makes of cod-liver oil, giving it one or two hours after breakfast, after dinner, and after tea, as it does not then give rise to those disagreeable eructations which are apt to occur when it is taken during or just after meals, and the explanation is, that the oil, at this particular period, is brought in contact with the pancreatic juice, which has the power to change its character, and thereby prevent any disagreeable effects.

66. In the farther consideration of the *digestive process*, we find that the food, upon being introduced into the stomach, undergoes a kind of churning motion, produced by the alternate contraction and relaxation of the fibres composing the muscular coat. In this way the contents of the organ are forced around its interior, from one extremity to the other, "circulating promiscuously, like the mixed contents of a closed vessel, gently agitated, or turned in the hand." These motions, along with a temperature of about 102 degrees, and the solvent action of the *pepsin* which is contained in gastric juice, the food is gradually reduced to a pulp, and in this form takes the name of *chyme*. This new product is of a grayish color, semi-fluid, and of a slightly acid but insipid taste. It passes gradually through the pylorus into the duodenum, (plate III., p. 25,) where it mingles with the bile and pancreatic juice. Here a chemical change takes place in the chyme, resulting in the formation of another product named *chyle*, which is nothing more than the nutritious portion of the food separated from that which is innutritious. The part which the pancreatic juice performs in reference to the fatty matters submitted to its action, has been already explained. (Par. 64.)

67. The *chyle* is a milky, alkaline fluid, which is taken up by the intestinal absorbents and carried into the circulation for the support of the body. The process of absorption takes place gradually, as the chyle, together with a reddish matter which is insoluble and excrementitious, moves slowly through the intestinal canal. Indeed, the mucous membrane lining the small intestines, is thrown into plaits or folds similar to that of the stomach, by which its absorbing surface is not

only increased, but the irregularities to which the folds give rise, prevent the contained matters from being urged on with too much rapidity in their downward course.

68. The contents of the intestines remain in a fluid state till they arrive in the vicinity of the cœcum, and here, the chyle having been in a great measure absorbed, they acquire a greater degree of consistency, and begin to assume the color and smell of ordinary feces.

69. It has been generally thought that the excrementitious matters of the bowels do not assume the strong and peculiar odor of feces until they arrive in the cœcum, but there are cases on record showing that the small intestines may become the seat of feculent accumulations. This has happened particularly where the large intestines have become impacted with feces, from long continued constipation, and thereby giving rise to a similar accumulation in the small intestines. Dr. Annesley mentions a case in which the small intestines were found, after death, to be completely loaded with feculent matter. Indeed, it is now generally understood, that the strong odor of the feces is not so much due to the excrementitious portions of the food, as to the putrescent elements which are eliminated from the blood by certain little glands, scattered along the mucous membrane of the intestinal canal. These putrescent elements may be poured into the intestines very copiously in consequence of some local irritation, or from the undue action of a purgative, and hence we frequently notice feculent discharges from the bowels in which we feel assured that there is no blending of the waste matters of the food.

FECES OR EXCREMENTITIOUS MATTERS OF THE INTESTINES.

70. The matters which are voided from the bowels by stool are termed *feces*. These evacuations are entitled to more attention and consideration than they generally receive, for they "are often most important guides to the discovery of disease," and particularly with regard to the condition of the liver and intestines, which are so generally involved in the diseased processes of the system.* Professor Wood, in his Practice of Medicine, very truthfully remarks, that "the habit of inspecting the evacuations of the sick, however disagreeable it may be, is indispensable to a proper performance of the duties of the physician. A false delicacy may, under other circumstances, lead only to inconvenience; in our profession, it is but too frequently fatal."

71. The average quantity of feces passed daily by a man, according to Boussingault, is five and a half ounces. In disease the quantity is exceedingly variable. Morgagni mentions the case of a woman who passed *forty pints* of a limpid fluid in a single day. Zimmerman mentions a form of dysentery in which some patients went to stool two hundred times in twelve hours, passing large quantities of matter. On the other hand, we often find the bowels sluggish, and without an evacuation for days, weeks, or even

* The examination of the stools is very important in diarrhœa, for if they are deficient in bile, it has been found that opium, in the usual doses, is more injurious than beneficial; whereas, if the evacuations are bilious, opium may be used with safety, and is, indeed, a valuable remedy. See *Braithwaite, No. 18, p. 118.*

months. We are frequently told by female patients, that they go a week or ten days without a movement of the bowels. Dr. O'Beirne mentions the case of a young lady who was without any fecal discharge for six months, and yet she was restored to perfect health by this skilful physician. Dr. Copeland, in his Dictionary, relates the case of a Frenchman who was obstinately costive for four months, and when evacuations were procured, it was discovered that he had passed the stones of grapes which he had eaten a year previously. Upon examination after death, it was found that his bowels contained sixty pounds of fecal matter.

72. The fecal discharges vary in consistence from that of a soft solid, which is the healthful characteristic, to the thin rice water discharges of Asiatic cholera. In some diseases they are harder than in health, as in cancer of the stomach, and particularly lead colic. (Chomel.) In the latter disease, they assume the form of small, black, hard balls, resembling the excrement of sheep. The books term them *scybala*. These rounded masses are frequently discharged from the bowels independently of lead colic. We prescribed for a young English woman, who had been sick a year or more with disease of the liver, as it was termed, and her physicians had pronounced her case hopeless. Instead of enlargement of the liver, we found an impacted state of the cœcum and colon, and prescribing medicine to act briskly upon the liver and bowels, she soon began to discharge large masses of *scybala*, the evacuation of which continued for several days. The bowels then assumed a natural action, and she recovered without further treatment.

73. The color of the feces is more variable than any other of their attributes. From the yellowish or brownish color, which is observable in health, they may become green, white, black, or red. The bile imparts to them a yellow color, and a deficiency of it gives rise to *clay colored stools*. Blood from the stomach, undergoing changes as it passes through the intestinal canal, imparts to the feces a black color, and sometimes they resemble chocolate or coffee grounds. When blood makes its appearance unchanged, we know that it is from the rectum, or anus. Large quantities of blood are sometimes passed from day to day in consequence of piles, and frequently without the patient's being aware of it. They become very pale and debilitated, and wonder what it is that is undermining their health. The red stools in dysentery are due to the blood which is mingled with the mucous or slimy excretions peculiar to that disease.

74. The stools are frequently rendered very *dark* or *black* from the action of purgatives too long continued. This abuse, according to Dr. Eberle, is very apt to occur in the treatment of bilious fevers. The longer the purgatives are given, he says, the fouler does the tongue become, and the more is the stomach disturbed.* Dr. Jackson, of the Pennsylvania University, says that black and fetid stools rarely occur in fevers, unless the patients have been purged a considerable time,

75. The *green stools* which are so frequently met with, particularly in children, are usually attributed to the presence of bile, but this seems now to be

* Eberle's Practice, 4th ed. Vol. i. p. 138.

rather questionable. Dr. Graves, a distinguished physician of Dublin, claims the credit of having first pointed out this error, as he regards it, and contends that this green secretion comes from the surface of the small intestines, and is generally the result of irritation. Bile, he urges, when secreted in large quantities, is never green—it may have a lighter shade of yellow, but is never green. Morbid bile, he acknowledges, may irritate the intestinal mucous membrane, and cause an effusion of this green secretion, but the color itself is not due to the presence of bile. Calomel, if it should irritate the bowels, will also produce a copious secretion of a deep green color, similar to that which arises from other causes. Besides, we sometimes have a green discharge from the eye, when it is inflamed, and from the mucous membrane lining the urethra, or vagina, without any agency whatever of the bile. Dr. Graves repeats very emphatically, that “the discharges from the irritated surface of the intestines in children do not consist of morbid bile—neither are they to be removed by calomel or strong mercurial purgatives. It is by changing the diet, keeping the child warmly clothed, &c., that this diseased secretion is to be checked.

76. Other medicines, besides calomel, have the effect to change the color of the feces. Rhubarb imparts to them a yellow, and sometimes a reddish color. The preparations of iron render them black, probably from the formation of a sulphuret of iron. Acetate of lead produces in them a slate color, and if it be taken in large doses for a considerable time, it gives rise to a black or almost inky appearance. We have already spoken of purgatives, in reference

to the irritation which they produce. (Par. 74.) Changes of color in the feces from medicine, should not be mistaken for those which arise from other causes.

77. The feces in some cases become extremely fetid, particularly in intestinal disorders, and putrid fevers.

78. The form which the fecal matters assume upon being voided, is sometimes worthy of notice. In cancer of the rectum, for example, previous to ulceration, they are represented as being elongated, and often flattened into the form of a ribbon, preserving, to a certain extent, the size and form of the intestinal contraction.

79. The feces vary very much in character, according to the disease which is present. They are mucous or slimy in dysentery, as already mentioned; bilious in bilious diarrhœa, and some other diseases; mixed with chyme, or chyle, or half-digested food, in certain cases; or blended with pus, as in chronic inflammation, or ulceration of the bowels, or when an abscess adjacent to the intestines discharges itself into this canal. Chyle, as mentioned above, is sometimes poured back into the intestines from the lacteal vessels, after it has been absorbed, in consequence of the irritation of a purgative, or irritation from other cause, arising a few hours after a meal. Albumen, which is analogous to the white of an egg, and which in one form or another, is an important part of animal and vegetable foods, is present in the rice water discharges of Asiatic cholera, manifesting itself in small white flakes. Enormous quantities of this, according to Dr. Osterlen, are passed also in dysentery, and hence the rapid emaciation of which he speaks.

A much greater quantity of it, according to this writer, is lost in dysenteric discharges, than in discharges from calomel and jalap, or other intestinal irritations, and he therefore urges the great importance, in the treatment of dysentery, of guarding as much as possible against the loss of this material.

80. Various medicines, taken habitually, and for a long time, such as magnesia, sulphur, chalk, mustard seed, patent pills, &c., have been known to accumulate in the bowels to a wonderful extent. Dr. Burne has related several interesting cases of the kind.

81. Sir Benjamin Brodie mentioned a case to Dr. Burne, in which magnesia had collected in balls in the rectum and produced a high degree of irritation, which ceased when the balls of magnesia came away.

82. A gentleman dosed himself regularly with *Henry's Magnesia*, which he preferred to any other form of the medicine, because it would "work itself off." Getting tired of the remedy, however, he ceased to use it, and six months after that time, he died. A post mortem examination revealed a magnesian accumulation in the colon weighing *five or six pounds*.

83. An old gentleman who had taken white mustard seed daily for several weeks, was seized with a pain in the bowels, for which he swallowed a cathartic. This caused the evacuation of a large quantity of the seed in compact balls, followed by entire relief.

84. A lady swallowed a spoonful of sulphur daily for several weeks, and five months afterward, complaining of intestinal pain, she took a dose of physic. To her surprise, she evacuated the sulphur in a large

quantity, which had been impacted in the bowels during the whole of that period.

85. Dr. Paris attended a patient with pain in the bowels, for which there seemed to be no obvious cause. A brisk cathartic being prescribed, a quantity of patent pills was evacuated, many of which were sticking together and forming masses of larger or smaller size.

86. A case is related in which pills of soap and rhubarb formed a large compact mass in the rectum, producing all the symptoms of strangulated hernia or rupture.

87. *Fruit stones* also accumulate in the bowels. An authentic case is related of a person with a tumor in the abdomen, attended with spasmodic pains, and after suffering for three years, he died, when the colon was found distended with *three pounds of cherry stones*, and amongst them *forty lead balls*, which he had swallowed in the hope of obtaining relief.

88. A boy ten or eleven years old was seized with pain in the bowels and tenesmus. His physician was induced to examine the rectum, and here he found an accumulation of cherry stones, which he removed to the number of *three hundred and twelve*.

89. Mr. Dendy relates the case of a man 60 years old, in whom, after death, an egg cup was found impacted in the ilium, about ten inches from the cœcum, (see plate III. p. 25.) It was supposed to have been swallowed. It had passed through the pyloric orifice of the stomach, and traversed the small intestines until it lodged at this point. The man had suffered with abdominal pain, retching, etc., until he died.

WHERE DO THE FECES ACCUMULATE?

90. This question naturally associates itself with the subject of injections, and is, moreover, worthy of special consideration, inasmuch as it will be found to blend itself intimately with the study of the diseases belonging to the abdominal cavity, and particularly those of the intestinal canal itself. What we have to say upon the subject is derived principally from the admirable little work of Dr. O'Beirne, of Dublin, entitled "New Views of the Process of Defecation, and their application to the Pathology and Treatment of Diseases of the Stomach, Bowels, and other Organs."

91. Physiologists, according to Dr. O'Beirne, have universally described the fecal matter as passing freely from the sigmoid flexure of the colon into the rectum, and gradually distending it until such a sense of uneasiness is created as to rouse the diaphragm and abdominal muscles into action, when it is promptly expelled from the body. Another universally received opinion, according to the same authority, is, that the power of retaining the feces and controlling their discharge, depends exclusively upon the sphincter muscle of the anus. (Par. 49.) Both of these propositions are regarded by Dr. O'Beirne as entirely erroneous.

92. It is contended, as previously stated, that the rectum, above its pouch, (X, plate III. p. 25,) is always contracted and empty, excepting at the moment of evacuating the bowels, and that therefore it is not to be considered as a reservoir of the feces. In support of this a number of familiar proofs are given.

93. First. When a surgeon is obliged to pass

his finger up the rectum it is rare that he encounters either fluid or solid feces, or that his finger is soiled when withdrawn. It is not denied that the feces are now and then detected in the healthy rectum, but it is always in a small quantity, and in the pouch or enlarged portion, which does not contract.*

94. Second. It is well known to those who are in the habit of employing injections, that the terminal tube of the syringe, upon its withdrawal from the rectum, is rarely or never soiled with fecal matter.

95. Third. The sphincter muscle of the anus is weakened in prolapsus ani, (falling of the bowel,) and sometimes it is divided in a surgical operation, which renders it for a time incapable of acting as a sphincter, and yet in neither case is the power of retaining the feces at all impaired.

96. Fourth. It frequently happens that considerable force is required to inject a fluid into the bowels, as previously mentioned, and this is unquestionably owing to the resistance which is offered by the contracted rectum.

97. Fifth. Membranous filaments have often been found stretching across the rectum, but seldom or never in the cavity of the small intestines, cœcum, or colon, which proves that the rectum must have been contracted sufficiently long for the firm organization of these filaments.

98. Dr. O'Beirne passed a stomach tube up the rectum to the height of two inches, and neither flatus nor feces escaped through it, but the tube could be moved about freely in a space which was known to

* The rectum from a loss of organic sensibility, etc., may become impacted or loaded with feces, but this is an exception to the rule which Dr. O'Beirne has sought to establish.

be the *pouch of the rectum*, and which was in an open and empty state. From the highest part of the pouch to the upper extremity of the rectum — generally a distance of six or eight inches — the introduction of the tube required a considerable degree of force, and the rectum was plainly felt to be in a contracted state.

99. When the flexible tube reaches the uppermost point of the rectum, as we have just described, the resistance to its further passage is sensibly increased, but by using a proportionate degree of pressure, it passes rapidly forward, as if through a ring, into a space in which its extremity moves about freely, and at the same instant there is a rush of flatus, or fluid feces, or of both, through the tube.

100. It happens in some cases that neither gaseous nor liquid matter escapes at this instant, owing to the extremity of the tube having entered a solid mass of feces in the sigmoid flexure, which may be readily detected by the sense of touch, and upon withdrawing the instrument, it will be found that its perforations are filled with solid excrement.

101. In every instance where the tube, after being withdrawn, presents the least appearance of fecal matter, it is confined to that portion of the extremity which has entered the sigmoid flexure.

102. The inferences to be drawn from the facts already stated, are, first, "that in the healthy and natural state, all that part of the rectum above its pouch, is at all times, with the single exception of a few minutes previous to the evacuation of the bowels, firmly contracted and perfectly empty, at the same time that the pouch itself, and also the sigmoid flexure, are always more or less open and pervious; and

lastly, that the sphincter ani muscle is merely a subsidiary agent in retaining the feces."

103. Proceeding still further in the investigation of this subject, it is found that a short time previous to the evacuation of the bowels, the fecal matter, which has been collecting in the cœcum, is transferred in successive portions to the sigmoid flexure, which, in consequence of the distension thus produced, ceases to remain doubled upon itself, (*P*, plate III. p. 25,) but becomes more or less straightened, so that its contents are made to press somewhat perpendicularly upon the upper extremity or ring of the contracted rectum. The mere weight of the fecal matter, however, is not sufficient to force a passage downwards, and as this cannot be accomplished by the gentle pressure resulting from the alternate contraction of the diaphragm and abdominal muscles in ordinary breathing, nor by the expulsive action of the flexure itself, inasmuch as it is endowed with only a limited or inferior muscular power, the feces continue stationary, until the increasing accumulation and distension give rise to such a sense of uneasiness as to call the diaphragm and abdominal muscles into a more vigorous action. The force therefore which is exercised by this new agency, tends very powerfully to compress the organs within the abdomen, urging the floating mass of small intestines downwards, and even into the cavity of the pelvis, and necessarily to press forcibly not only upon the sigmoid flexure, but also upon the cœcum and bladder. (See page 139, plate IV.) In this way the contents of the distended flexure are driven into the rectum, which is thereby stimulated into an expulsive effort of its own, and consequently, the whole of the contents of its upper

portion are forced into the pouch below, giving rise to an additional sense of uneasiness, and a still stronger expulsive effort, resulting in a final and thorough evacuation of the bowels.

104. The bladder is not evacuated simultaneously with the rectum, because the contents of the rectal pouch press upon the urethra, preventing thereby the flow of urine which would otherwise take place; but as soon as the pouch is emptied, and the pressure upon the urethra removed, the bladder is at once relieved of its contents.

105. It now remains to be shown how the excrementitious matter which has entered the cœcum from the small intestines, is transferred to the sigmoid flexure; for it will be seen that its movement through the ascending colon is in opposition to gravity. It is contended, that while the excrementitious matter is filling the cœcum, the gases or flatus accumulate in the colon, intervening between the cœcum and sigmoid flexure, until it is filled to complete distension; and the pressure which these gases exercise, prevents the upward movement of the feces in the cœcum, as effectually as the introduction of air into the tube of a barometer prevents the ascent of the mercury. As soon, however, as the cœcum is filled with the excrementitious matter, and the colon is completely distended with the gases in question, the great expulsive agents already mentioned, namely, the diaphragm and abdominal muscles, are called into play, and by the pressure which they make upon the cœcum, colon, etc., as previously mentioned, together with the expulsive action of the intestine itself, the distending gas or flatus is removed, and the fecal contents of the cœcum move upward and onward in the colon until

they reach its descending portion. From this point they pass readily into the flexure and are expelled, as already pointed out. (Par. 103.)

106. The transfer of the fecal matter from the cœcum to the sigmoid flexure, is thought to take place very quickly. At all events, it frequently happened to Dr. O'Beirne, that in passing the gum elastic tube through the rectum into the flexure, there would be an escape of flatus but not of fluid feces, and this fact, together with the unresisting sensation communicated to the hand, and the unsoiled appearance of the tube when withdrawn, satisfied him that the flexure did not contain any feces at the moment of introducing the tube; and yet, upon the introduction of it after the lapse of four or five minutes, it almost uniformly happened that a portion of fluid feces, would escape through it, and the extremity of the tube, upon being withdrawn, would be found coated with solid fecal matter. The inference therefore seems to be inevitable, that the feces, in a healthy state of the intestinal canal, are not to be found in the sigmoid flexure, excepting just before an evacuation of the bowels.

107. The conclusions of Dr. O'Beirne are, first, that the cœcum is considerably distended before it is unloaded; second, that the whole of the mass by which it is distended, and no more, is transferred at each time that it is unloaded; third, that at the moment of going to stool, there is generally one mass of fecal matter in the cœcum and another in the sigmoid flexure, and consequently, that these may be considered as the measure of the quantity discharged when the bowels are said to be freed; fourth, that as two distinct acts of expulsion are always required before a healthy person finds his bowels sufficiently freed, the

that it becomes more and more contracted and impervious, and thus the constipation not only increases in severity, but becomes one of the most prominent features of disease.

FLATULENCE — GASES OF THE STOMACH, INTESTINES, ETC.

109. *Flatus*, or *wind*, as it is usually termed, is composed of certain gases which are formed in the stomach and intestines, and which, within certain limits, serve a very important purpose, namely, that of keeping up a permanent distension of these organs. The liquid and solid contents of the stomach and bowels are constantly varying in quantity, and therefore the gases serve to maintain the organs in an equable as well as a permanent state of distension; and it seems to be a wise provision of nature, that these gaseous products “only quit their position when their volume exceeds a certain point, and which, consequently, are not absorbed.” (Liebig.) Without this distension, indeed, the stomach and intestines, but particularly the latter, would have their functions impaired, or permanently arrested; and hence we perceive that it is only when the gases are inordinately developed, that we are to consider them of a morbid character. In truth, there are many people with a perfectly healthy condition of the stomach and intestines, who are subject to these gaseous accumulations, arising, as a matter of course, from too great an indulgence of the appetite, or from taking food or drink incautiously which has a flatulent tendency.

110 Gaseous accumulations do not take place

merely in the stomach and bowels, but occasionally also in the womb and bladder, constituting, in some cases, a very serious form of disease. The same thing occurs in the cavity between the external surface of the lungs and the interior of the chest, called *pneumothorax*, and also in the intercellular structure of the lungs, termed *emphysema of the lungs*.*

111. Dr. Mitchell, of Dublin, relates the case of a woman in one of the hospitals in that city, in whom enormous quantities of air were secreted by the womb, which he mentions to prove what he terms the secretion of air by this mucous lined cavity; and another woman in whom the quantity of air secreted in the bladder was also enormous, accompanied by so much irritation of the mucous membrane as to prevent her from retaining her urine for more than two or three minutes, excepting when under the influence of opium in large doses. Neither of these cases is rare in practice. Women, in particular, are often annoyed with the difficulty, without knowing how to explain it, and, seeking professional advice, they learn for the first time that the womb is the seat of gaseous accumulations.

112. The stomach frequently becomes so distended with gas as to form a large elastic tumor in the epigastrium, which is recognized by the clear, ringing sound obtained by percussion.† In some instances, almost unlimited quantities of air are removed from the stomach by belching, and now and then we meet with patients who seem to have the power of dis-

* Emphysema is a swelling produced by air or gas.

† Percussion is performed by laying the finger of one hand lengthwise over the distended organ, and tapping it gently with the tip end of one or more fingers of the other hand.

charging hundreds of cubic inches of this flatus in a few minutes.

Sir Francis Smith, who is quoted by Vogel, relates the case of a gentleman who suffered from an enormous development of gas in the stomach, which he brought up by eructation; he also occasionally experienced a development of gas in the bladder; and upon one occasion, while in a water bath, innumerable bubbles of air, the size of a pin's head, issued from his breast, shoulders, abdomen, and hands. On removing the hands and arms from the water, the air-bubbles disappeared, but upon re-immersing them the bubbles gradually returned.

113. P. Frank is also quoted by Vogel as saying that "the cœcum and colon will occasionally swell to the thickness of the armor thigh, and may even burst." Indeed, the flatulent distension of the stomach and bowels is so great in some instances, as to make violent pressure upon the lungs, and interfere seriously with the breathing process. Dr. Ashmead, of Philadelphia, relates an extreme case of this kind, in which death was the consequence.

114. Flatulence, accompanied with a rumbling or gurgling sound in the bowels, is termed *borborygmus*; and when the abdomen is distended, so as to be visible to the eye, it takes the name of *tympanites*, so called from a word signifying drum, because the abdomen sounds like a drum when struck. In *tympanites*, the flatus or wind is usually in the intestines, but in rare cases it may collect in the peritoneal cavity — that is, external to the intestines, and between these and the walls of the abdomen. Tympanitic distension may arise and disappear suddenly, or it may continue for years, or perhaps for a lifetime. The increasing

collection of flatus is very much favored by constipation ; for if the feces are permitted to accumulate in the sigmoid flexure of the colon, (plate III. p. 25,) the gases have no opportunity of escaping, and thus by continued distension of the bowels, their muscular or contractile coat is gradually weakened, and the constipation becomes more and more unyielding and obstinate.

115. The pent up gas in the stomach and intestines does not only produce local pains, which are often severe and perhaps excruciating, but it is the cause also of violent pains in distant parts of the body, as the chest, shoulders, head, and even limbs.

116. *Composition and Source of the Gases.* The gases of the stomach and intestines are principally composed of oxygen, carbonic acid, hydrogen, carburetted hydrogen, and nitrogen. Oxygen is not often met with in the stomach, and is not found at all in the intestines. Carbonic acid and nitrogen are the principal gases of the stomach, with a trace of hydrogen. These gases are also found in the intestines, with carburetted hydrogen, and now and then, sulphuretted hydrogen. The oxygen which is received into the stomach, either enters into combination very speedily, or is absorbed by the blood before it reaches the small intestines.

117. These gases are derived from the decomposition of the food which takes place under the forms of fermentation and putrefaction, and also from the air which enters the stomach with the food and saliva. According to Liebig, the saliva possesses the remarkable property of inclosing air in the shape of froth, in a far higher degree than even soapsuds, and this air, by means of the saliva, which is secreted

daily in a large quantity, passes into the stomach with the food. There the oxygen of the air enters into combination, while its nitrogen is given out through the skin and lungs—and thus we have a very considerable source of nitrogen.

118. The *putrefactive fermentation*, according to Vogel, is the most fruitful source of the intestinal gases, which vary with the substances to which they owe their origin. Fat, starch, gum, and sugar, for example, which are called *non-nitrogenous foods*, because they do not contain nitrogen, yield carbonic acid, carburetted hydrogen, and hydrogen, while the *nitrogenous foods*, so termed because nitrogen is an element in their composition, as wheat, rice, corn, and the lean flesh of animals, yield ammonia in addition to carbonic acid, etc.; and if sulphur be present, there is a development of sulphuretted hydrogen.

119. With regard to the putrefactive fermentation, Vogel argues that food moistened with water and exposed for twenty-four or thirty-six hours to a temperature of about 100 degrees, actually becomes putrid; that human feces present all the signs of putrefying matter; and that the gases in the intestinal canal are identical with those which are formed out of the human organism during the putrefaction of animal or vegetable bodies, consisting of carbonic acid, hydrogen, carburetted hydrogen, sulphuretted hydrogen, hydrosulphate of ammonia, and nitrogen, the nitrogen probably arising from the air which is swallowed. In a state of health, however, Vogel thinks that these accumulations of gas in the intestinal canal are very trifling, or may be altogether absent, whilst in certain diseased conditions they may be very abundant.

120. The truth, apparently, would seem to be, that in health, the intestinal gases are always present in a limited quantity, sufficient, however, to keep up a moderate or gentle distension of the bowels, and that when the quantity exceeds this, it is to be regarded as a morbid accumulation, arising from disease in the intestinal canal, dietetic irregularities, or some obvious cause of a similar character. Contrary to Vogel, therefore, we perceive the importance of the gases in maintaining a permanent distension of the stomach and bowels in health, and we also perceive that nitrogen forms a considerable proportion of those gases. Like a faithful sentinel, it seems to be always at its post, ready for service; and yet Liebig asserts that the nitrogen is not applied to any special use. May it not, however, be a sort of balance-wheel in regulating the distension of the stomach and intestines, but particularly the latter? This distension is all important to the well-being of the system, for without it, the respiration and circulation would be interfered with, and even the feces could not be evacuated without its agency. The nitrogen, then, may play a very important part in aiding this distension, for if the other gases are deficient, this is ready to take their place. The fact that it is always present in the intestines, would seem to mark it as a very singular intruder, if it was not intended for some specific use. Sulphuretted hydrogen, on the contrary, which is so remarkable for its fetid odor, is of no possible use, so far as we know, in the intestinal canal, and the fact that it is but seldom found among the intestinal gases, would seem to imply a consistency in the laws which govern the intestinal functions.

121. *Are the gases secreted?* It is an unsettled

question whether the mucous membranes of the stomach, intestines, uterus, bladder, etc., are capable, under certain circumstances, of secreting the gases which are found in the cavities of the organs which they line. John Hunter first suggested the possibility of this, and since his time, the negative as well as the affirmative of the question has been advocated by various writers of distinction. Without pretending to examine into the merits or demerits of the question, it seems to us that the phenomenon under consideration is capable of another and a satisfactory explanation, without any aid whatever from the doctrine of secretion. We allude to the well known property which the gases possess of permeating animal membranes, and which would seem to account for the rapid accumulation of gases, under particular circumstances, in the different cavities of the body. "This permeability to gases is a mechanical property, common to all animal tissues; and it is found in the same degree in the living as in the dead tissue."

122. If a bladder be filled with carbonic acid, nitrogen, or hydrogen gas, tightly closed, and suspended in the air, it will lose the whole of the inclosed gas in twenty-four hours, and common air will be found in its stead. If the bladder, thus filled with air, be immersed in an atmosphere of carbonic acid gas, the air, in its turn, will pass outward, and the heavy gas will penetrate the bladder until it bursts.

123. These simple and familiar experiments, as they now are, will show how readily the gases are transmitted through animal membranes; and the living structure, both of animals and of man, serve to illustrate this great law of the diffusion of gases in a still more satisfactory manner.

124. The fresh, juicy vegetables which overload the stomach of the cow, according to Liebig, pass into fermentation and putrefaction, whereby so great a quantity of carbonic acid and carburetted hydrogen are generated as to distend the organ enormously. These gases, it is asserted, cannot escape through the œsophagus, and yet, in a few hours, the distended body of the animal is diminished in size, and at the end of twenty-four hours, no trace of the gases is left.

125. In the wine countries of Europe, according to the same authority, death frequently occurs from drinking what is called feather-white wine. This poisonous wine is swallowed in a state of fermentation, which is increased by the heat of the stomach. The carbonic acid gas which is disengaged, passes through the coats of the stomach, penetrates the diaphragm, and all of the intervening membranes, until it reaches the air-cells of the lungs, and displacing from these the atmospheric air, the patient dies with all the symptoms which ensue from an irrespirable gas. The surest proof, says Liebig, of the presence of the carbonic acid in the lungs, is, that the inhalation of ammonia, which combines with it, is the best antidote against this kind of poisoning.

126. Vogel states that the peculiar slate-gray color of the surface of the spleen and liver, which is frequently observed in examinations after death, is due to the action of sulphuretted hydrogen, or hydro-sulphate of ammonia, which must necessarily pass through the coats of the intestinal canal before it can reach these organs.

127. Magendie and Girardin confined a portion of the intestine of a live dog, entirely emptied of its

contents, between two ligatures, and in a few hours the included portion was filled with air, which escaped with a hissing sound on puncturing the intestine. This fact is quoted as an evidence of secretion, but it is quite as reasonable to suppose that the distension was produced by the gases external to the intestine penetrating through its coats. In the same way is the air or gas contained in the swimming bladder of the fish spoken of as an "actual secretion," when the evidence is quite as strong that the bladder is filled by the gases which enter it from without.

128. Flatulent enlargements of the abdomen sometimes appear and disappear very suddenly in hysteria, without, as Chomel remarks, the occurrence of any gaseous emission. Large collections of air in the cellular texture under the skin, constituting emphysema, have been known to alternate with flatulence of the bowels. These and analogous cases would seem to indicate that the gases, by some law of our physical organization, have the power of changing places in the system, and passing readily from one cavity of the body to another, and in doing so, they must of course permeate the intervening membranes, which, in truth, do not seem to interpose any obstacle to their ready transmission.

PART II.

MANUAL OF DIRECTIONS, ETC.

USE AND VALUE OF INJECTIONS.

129. INJECTIONS or enemas, called also clysters and lavements, are liquids intended for introduction into the bowels, and may consist of warm or cold water, or of some medicinal fluid. The terms *injection* and *enema* are synonymous, the latter being derived from a Greek word signifying to inject.

130. Injections are used for several distinct purposes. 1. To evacuate the bowels independently of any cathartic or purgative effect. 2. To act upon the system generally through the medium of the intestines. 3 To restrain a diarrhœa or dysentery. 4. To shield the intestines from irritating matters or secretions. 5. To relieve painful and spasmodic affections of the intestines and stomach. 6. To dislodge worms from the rectum. 7. To produce a cathartic, tonic, or other medicinal effect, where

the stomach is too irritable to tolerate medicine. 8. To relieve the sufferings from tenesmus, piles, and other disorders of the rectum. 9. To afford nourishment to the system when there is an inability to swallow.

131. Injections make a prompt impression upon the general system, and therefore are very useful in a variety of diseases, as croup, hysteria, and convulsions; determination of blood to the head; inflammation of the lungs; inflammations also of the liver, kidneys, etc. The rectum and adjacent organs are powerfully impressed by injections, and consequently, they exercise a beneficial influence in inflammations of the bladder and womb, as also in retention of urine, painful stricture of the urethra, flooding after childbirth, etc. Injections, properly prepared, have an almost magical effect, in some cases, in the removal of the placenta or afterbirth, when it is unduly retained.

132. Persons of a costive habit, who are troubled with tedious or painful stools, or who suffer with a disagreeable or uneasy sensation in the rectum for many hours after a stool, will find injections of great value in relieving the bowels, as they will procure an immediate evacuation, and greatly diminish the sufferings which would otherwise ensue.

133. In suspended animation, warm stimulant injections are sometimes of great importance in arousing the dormant energies of life, and deserve to be remembered, when other means are likely to fail.

134. Life has been sustained for a considerable period by the employment of nutritious injections, where the individual has been unable to swallow. Dr. Currie, in his work on cold water, published a

long time before Priessnitz came upon the stage, relates a case in which life was prolonged in this way for sixty days.

135. There are very few ailments in which injections are not more or less beneficial, and in the slighter disorders to which the people are exposed, they will be found to constitute a safe and efficient class of domestic remedies.

OPINIONS OF AUTHORS.

136. *Professor Dewees*, in his *Practice of Physic*, remarks, "The value of enemata, is only beginning to be appreciated in this country," (United States.) "They have had to contend against much prejudice to gain their present consideration. An injurious and fastidious delicacy has prevented their general employment, especially out of our cities; and it is only within a few years even in our cities, that they have been looked upon as prompt and efficient remedial applications. For the good of the afflicted, we hope this prejudice will soon wear away; and that they will be looked upon as indispensable medical as well as domestic remedies."

137. *Professor Dunglison*, in his *General Therapeutics*, says, "Injections are valuable agents, where the powers of life are so much reduced that a rational fear is entertained as regards the administration of cathartics by the mouth."

138. *Dr. Warren*, of Boston, so well known throughout the country by this simple designation, published an article in the *American Journal of Medical Sciences*, on the *Prevention of Constipation*, which was afterwards republished in pamphlet form

for the benefit of the people, in which he says, "It would not be proper to pass over injections, so generally employed abroad and so little in this country. Their application is to be preferred, where it answers, to any cathartic. A valuable use of this remedy has been introduced by the followers of the much-exalted Broussais, on the supposition that it would extinguish inflammation of the intestinal mucous membrane. Cold injections into the rectum were proposed by them, and it was shown that cold water might be thus employed without alarming consequences. For the relief of the bowels, the prevention and cure of hemorrhoids," (piles) "the mitigation of urinary and uterine derangements, cold water, in quantity from a gill to a quart, is most valuable."

139. *Dr. H. H. Smith*, in his *Minor Surgery*, speaking of the use of injections, remarks, "If properly given their use is productive of little or no pain, even in cases of hemorrhoids," (piles.)

140. Professor Thomas D. Mitchell, of Philadelphia, in his *Materia Medica and Therapeutics*, speaks very emphatically upon the subject of injections, and says, "The value of this mode of medication, we fear, is not sufficiently appreciated by the profession; and hence the infrequency of mention made of them in medical reports.

141. "Owing to similarity of structure, it was found, long ago, that remedial agents operated on the system through the medium of injections in the same manner as when administered by the mouth; and that nutriment could be administered in the same way. When the stomach was exceedingly irritable, and would reject medicine or food, we could get all the advantages of either by a clyster.

142. "In cases of *habitual costiveness*, dependent on torpor of the alimentary canal, it is often best to reject all internal medicines, and to rely on injections of cold or warm water, repeated morning and night, or oftener. A pint is the proper quantity for an adult. If there be a plethoric condition, the cold water is generally most suitable; if the patient be feeble, warm water will answer better. This expedient invariably cleans out the bowels, and generally excites a more natural action higher up. It is a safe method, and too seldom resorted to."

143. The distinguished *Dr. Baille*, of London, so well known for his contributions to medical science, remarks, "Injections do not appear in this country," (England) "to be so highly appreciated as they deserve, although on the Continent their advantages are extensively acknowledged, and they constitute no trifling part of the practice of medical men. It is remarkable, that they are not in more general use, when we reflect how numerous are the complaints produced by a confined state of the bowels, and how quickly they are relieved by a removal of that cause. The occasional employment of injections is certainly the most convenient and comfortable way of obviating so frequent a source of misery and pain; and as injections do not produce temporary constitutional derangement, and may at any time be discontinued, the same objections cannot be urged against their employment which are so often made to other remedies; whilst their simplicity, and the facility with which they can at all times be used, are arguments in favor of their adoption. In a medical sense, they are invaluable; during the attacks of inflammatory disorders, and various other complaints to which the

bowels are subject, when the stomach rejects medicine of every kind, and when all other remedies prove quite ineffectual, how often do we find a common injection of the simplest kind produce the most salutary results; and by unloading the lower bowels, by clearing a passage for flatulent collections, and by acting as a kind of internal fomentation to the whole disordered canal, we suspend the most annoying and troublesome irritation, and produce tranquillity and rest."

THE IMPROVED FAMILY SYRINGES OR INJECTING INSTRUMENTS.

144. We deem it unnecessary to take up the space of this little volume in giving a minute description of the above instruments. A passing notice, however, of some particulars concerning them, seems to be required; and first of all the peculiarity of their construction, whereby they may be worked with one hand, which leaves the other hand free to hold and direct the terminal or injecting tube. This constitutes them preëminently superior as "self-syringes," to employ a term in common use, and hence they are particularly adapted to the requirements of women, in the treatment of their peculiar complaints. They are also equally advantageous in injecting the bowels, where the sphincter muscle is so relaxed as to require the terminal tube to be supported in the rectum by the hand.

145. The *angular injecting tubes* which usually accompany the ordinary pump syringes we do not furnish with our instruments, because they could be of no possible use. The long tube of our instruments

being flexible, it need scarcely be remarked that the terminal tube may be used at any angle required; besides as we have already explained, one hand is always free to keep the injecting tube in place. This is certainly much preferable to sitting down upon the angular tube, which is not only inconvenient and awkward, but also more or less painful, when the rectum is in an irritable condition.

146: The superiority of the piston or plunger, which we have introduced, does not consist merely in its peculiar construction, but also in the leather of which it is partly composed. This is prepared by a new and peculiar process, so that it does not readily part with its oily matter, and consequently it does not *dry hard*, like other leather, after being used or soaked in water. Indeed, this form of piston would be almost useless without this particular preparation of leather. If, in the lapse of time, the leather should require additional softening, let it be made as dry as possible in the sun, or by placing it near the fire, and then saturate it with melted tallow, only moderately hot. In doing this, the leather need not be removed from the piston.

ABBREVIATIONS, WEIGHTS, AND MEASURES.

147. *Abbreviations.* Gr. grain or grains; $\mathfrak{D}$, scruple; $\mathfrak{z}$, drachm; $\mathfrak{z}$, ounce; f $\mathfrak{z}$, fluid ounce; O, pint; lb, pound.

Apothecaries Weight.

20 grains,	.	.	.	1 scruple.
3 scruples,	.	.	.	1 drachm.
8 drachms,	.	.	.	1 ounce.
12 ounces,	.	.	.	1 pound.

148. When apothecaries sell medicine in a small quantity, as a grain, scruple, or drachm, it is by the preceding scale; but in larger quantities, they adopt the *avoirdupois* scale, which is also employed by our grocers, provision dealers, etc., and in which 16 ounces instead of 12, are estimated as a pound.

Apothecaries or Wine Measure.

8 fluid drachms,	.	1 fluid ounce.
16 fluid ounces,	.	1 pint.
2 pints,	. . .	1 quart.
4 quarts,	. . .	1 gallon.

149 The druggists employ a *graduated measure*, manufactured of glass, with the drachms and ounces accurately indicated by a scale which is marked upon the glass. Families would find this measure very useful for many purposes, and particularly in dealing out medicine.

Domestic or Approximate Measurement.

Teaspoonful,	.	1 fluid drachm.
8 teaspoonfuls,	.	1 fluid ounce.
Tablespoonful,	.	$\frac{1}{2}$ a fluid ounce.
Wineglassful,	.	2 fluid ounces.
Teacupful,	.	4 fluid ounces.
Gill,	.	4 fluid ounces.

Families would find it very convenient to have a teaspoon graduated to a fluid drachm, and a tablespoon graduated to half a fluid ounce.

INFUSION AND DECOCTION.

150. When a medicine is *steeped* in water, either hot or cold, the liquid is termed an *infusion*; when *boiled*, it takes the name of *decoction*. *Tea* is an infusion—*coffee*, when boiled, a decoction.

QUANTITY OF FLUID FOR AN INJECTION.

151. This is governed by the age of the individual, the stimulant or non-stimulant character of the injection, and other considerations. If it be the object merely to evacuate the bowels, the following quantities may be regarded as the usual standard.

Infant at birth, a fluid ounce; infant a year old, two or three fluid ounces.

Child five years old, four to six ounces.

Youth twelve years old, six to eight ounces.

Adult, twelve ounces to a pint.

152. In either case, if there are no signs of a speedy evacuation, an additional quantity of fluid may be injected; but if a painful sense of distension, or uneasiness in the bowels should occur, it will be sufficient to retain what has been injected for a time, in order to promote a thorough fecal discharge. If the rectum should be in a relaxed or weakened state, the retention may be aided by the application of a folded cloth or towel.

153. When it is the object merely to evacuate the bowels, the injection should be continued until this is accomplished, without particular regard to the quantity of fluid employed. There is no danger in using a large quantity of fluid, because the intestine, as soon as it undergoes a certain degree of distension,

will contract, and very soon expel its contents. If the injection consists of warm water, however, a pint is usually sufficient, particularly if it consists of a stimulating fluid, such for example as the *stimulant injection* of this book, for which see index.

154. The quantity of fluid which may be injected in a given case, depends upon the condition of the bowels, the temperature of the fluid, and its stimulant or non-stimulant character, as already mentioned. For example, two or three ounces of fluid will usually evacuate the bowels of an infant a year old, while in some cases, half a pint of warm water has been injected, before this effect was produced. Again, if the rectum in an infant of this age be in an irritable state, as in severe purging, dysentery, etc., and it is desirable to administer a soothing or anodyne injection with a view to its retention, it will be found, in some cases, that if the quantity exceed even half an ounce, it will be immediately expelled.

155. It may be added, that three quarters of a pint of *warm water* will make as strong an impression on the bowels of an adult, as a pint and a half of *cold water*; while, at the same time, an actively stimulating fluid in the small quantity even of a gill will oftentimes evacuate the bowels more promptly and thoroughly than either of them. There are other cases in which the bowels, from a torpid or sluggish condition, will tolerate several quarts of an injected fluid.

156. An interesting fact in regard to quantity was recently communicated to us by a gentleman who stated, that having been constive for a long period of his life, he was induced to commence the use of cold water injections, which he employed daily in the

quantity of a gallon, using, for the purpose, an elongated rubber bag. At length he began to diminish the quantity, and gradually reduced it to a wine-glass full, which he found all-sufficient in procuring the desired evacuation. In winter, when the water was very cold, he would take off the chill by holding it a few moments in his mouth.

157. An opiate or anodyne injection for an adult, intended to be retained, and given to relieve irritation or spasm of the rectum, urethra, or bladder, is better employed in a quantity that will merely fill the pouch of the rectum, which, according to Dr. O'Beirne, is not capable of containing more than two ounces. See plate III., p. 25, letter X.

158. *Bland or soothing injections*, intended to relieve intestinal irritation irrespective of the rectum, are more efficient in the quantity of a half or three quarters of a pint, and are usually retained after one or two repetitions, or without a repetition, if the bowels have been previously evacuated with a more active or stimulant injection.

159. *Purgative injections* are also administered in the quantity of half a pint or a pint, and if not retained at first, require to be repeated until the bowels are relieved. Of course, so far as retention is concerned, they should be but slightly warm, and devoid of any pungent or stimulating ingredient.

TEMPERATURE OF INJECTIONS.

160. The benefit which injections are capable of conferring, is dependent somewhat upon their temperature. Warm injections are more efficacious in acute diseases, and for the occasional evacuation of the bowels; while in colic, and other intestinal

pains, together with pains or cramps of the stomach, they should be employed as hot as they can be borne, taking care that they do not produce any feeling of discomfort. As a tumbler of water, swallowed as hot as it can be borne, is sometimes more efficacious than any other remedy, in relieving cramp of the stomach, so is an injection of water, of a similar temperature, a most admirable remedy in many cases of intestinal cramps and pains.

161. Warm fluids employed in this way, have the effect, perhaps, to change the electrical condition of the system, and are therefore entitled to some consideration. The illustrious John Hunter suffered frequently with spasm of the stomach, and after trying every remedy he could think of to no purpose, he swallowed draughts of hot water, which gave him ease, and he afterwards adopted this practice among his patients for the relief of pains attendant upon dyspepsia.

162. Water as hot as the patient can possibly drink it, says an eminent writer, will frequently cure palpitations, spasms, headaches, flatulence, and acidity, almost like a charm. Lefevre tells us that he was seized with violent spasms of the stomach, which caused him to bend almost double; he swallowed a basin of very hot tea, and almost immediately his spasms ceased, and with them a troublesome cough which had lasted a long time.

163. When injections are employed daily for the relief or cure of constipation, or other chronic maladies, they should be cold, as they have a more invigorating effect. Warm injections, frequently repeated, and continued for any length of time, have a weakening influence. In commencing the use of

cold injections, however, the temperature should not be less than 72 degrees; and if you are without a thermometer, water may be selected of about the temperature which we find it in our rooms of a hot summer's day, after it has stood for some time. Colder than this, the injections produce a very unpleasant sensation in the rectum, and sometimes a painful feeling of cramp. Dr. Wesselhœft, the hydropathist, says he has never known this cramp to ensue, even in children, where the temperature was not less than 72 degrees. After a time, as the rectum becomes accustomed to these applications, still colder water may be employed, taking care, however, to lower the temperature gradually as circumstances may seem to warrant.

164. It must not be forgotten, however, that cold water is sedative in a marked degree, tending thereby to diminish vital action, and hence it is very useful in subduing inflammation, but carried beyond a certain point, it weakens the tone of the intestines, and renders the constipation still more obstinate. The *stimulating injection* of this book is much more appropriate in such cases, as it rouses up a new action in the intestines, and we have frequently known it to give speedy relief in cases where cold water in large quantities had been used ineffectually.

165. In cases of general debility, warm injections are always to be preferred.

DIRECTIONS FOR TAKING INJECTIONS.

166. *Position, etc.* In using an instrument with a long flexible tube, the stooping position is the most convenient, resting the back, if you please, against

the wall or partition. The instrument, as a matter of course, is placed in front of the individual. Some prefer, while in this stooping or kneeling position, to rest the body on the right or left foot and the opposite knee. Each one will soon ascertain the position best suited to his purpose.

167. If the injection is to be administered to a patient confined to his bed, he should be upon his right or left side; in case several pints of fluid are to be injected, the right side is always to be preferred, with the hips somewhat elevated, as then the fluid will find its way more readily into every part of the colon. (See illustration, plate III. p. 25.) Some hard, flat body should be placed firmly upon the bed, near the patient, to support the instrument and vessel containing the fluid. A book will often answer very well.

168. If the patient is an infant, or young child, it may be held across the lap of its mother, or nurse, and the syringe placed upon a chair, close at hand. In case of resistance on the part of the child, its movements will be communicated to the flexible tube, so that there will be no danger of doing it injury, as is obviously the case in using the common syringe.

169. *Introduction of the Tube, etc.* The end of the rectal or injecting tube should be pressed gently and *continuously* against the sphincter muscle (*R*, plate III. p. 25,) until it enters the rectum, and the pressure continued until the tube is fully introduced. Should the point of it become entangled with the lining membrane of the rectum, so as to impede its course, its direction is to be changed as the case may seem to require. A little time and patience will insure the easy introduction of the tube.

170. When the rectum is irritable, as in hemorrhoids or piles, the forefinger of the left hand, well smeared with olive or sweet oil, should be first introduced, and then the tube, also well oiled, may be readily passed along the finger as a guide or director, and in this way introduced with little or no pain.

171. *Injection of the Fluid.* In accomplishing this, the pouch of the rectum, which is always open, is first filled, and then the fluid passes more slowly through the contracted portion of the rectum situated between the pouch and the sigmoid flexure. In obstinate constipation, this portion of the rectum is sometimes so rigidly contracted, that the fluid cannot be made to pass through it without employing considerable force.

172. The fluid, as a general rule, should be introduced slowly, and more particularly if the quantity be large. Dr. Hall, of Glasgow, was twenty minutes in injecting five pints of fluid in a case he mentions, saying, "it is highly important that the process be conducted as slowly as possible." In this case, after the first two or three pints had passed, the patient could trace, by his sensations, the progress of the fluid along the course of the colon, even as far as the cœcum, and the sense of distension was at times almost insupportable.

173. Dr. Marshall Hall lays down the rule that we should be "as slow as possible, and as long as possible." In this way, he says, "the intestine is filled before it is distended, its peristaltic action is at length excited by the stimulus of that distension, and it contracts energetically in a mass, which, by its bulk and rapid flow, carries away the feculent matters mechanically."

174. These remarks, however, apply to injections in a much larger quantity than are usually administered. When the fluid is employed in the ordinary quantity of a pint, and is not of a stimulating character, it may be injected in most cases very rapidly, and without any interval of rest; but if a painful sense of distension arises, the individual should pause until this partially or wholly subsides, and then go on with the injection.

175. It happens occasionally that a fluid cannot be thrown into the bowels, in consequence of the rectum being impacted with indurated feces, (note, p. 47,) and in such a case it is necessary to remove the accumulated mass with some convenient instrument. This being accomplished, injections may be used for the double purpose of washing out the rectum, and allaying any irritation which may exist. Cases of this kind generally require the aid of a physician.

176. *Vaginal Injections.* Our remarks upon this subject will be found in the concluding part of the volume, for which see index.

CLEANSING THE SYRINGE.

177. The instrument should be cleansed with pure water after using a medicinal injection, particularly if it has an unpleasant odor, or is likely to do injury by remaining long in contact with the instrument. The water should be drawn in and forced out through the flexible tube, filling the instrument once, twice, or thrice, as the case may seem to require.

178. When oily injections are used, the instrument should always be cleansed with strong soap suds, or with potash or pearlash water of sufficient strength

to act upon the grease, rinsing afterwards with pure water. If the injections contain *oil of turpentine*, the washing should be attended to immediately, because the turpentine is calculated to injure the flexible tube, if permitted to remain in contact with it a long time.

179. In washing the plunger, it should not be immersed in *boiling water*, as this would injure the leather. Warm water is all sufficient. In returning the plunger into the barrel, care should be taken to adapt the leather accurately to the interior of the barrel; and if there is any trouble in the introduction of it, this may be obviated by using the rounded end of a paper folder, or the back of a bluntly pointed pocket knife.

180. *To Cleanse Britannia.* Warm and strong soap-suds will suffice for this, but the better way is to rub the metal over with a rag or flannel slightly saturated with sweet oil, or even lamp oil; then, by dusting on a little powdered whiting, and rubbing with a soft towel, the metal will be restored to its usual brilliancy.

181. *To Cleanse Silver.* Those who use silver-ware, need not be told that it is liable to become discolored, and our silver-plated instruments are no exception to the rule. The best method of cleansing silver, is to form a thick paste with alcohol and whiting, and apply it to the surface of the metal with a rag or brush; as soon as it is dry, which will be in a few moments, rub well with a soft clean towel, which will reproduce the natural brilliancy of the silver. Oily or greasy matter, if any be present, must be previously removed with strong soap-suds, rinsing afterwards with pure water. Rubbing or "scouring" the instrument with rotten-stone, and other similar

substances, is quite unnecessary, and will only serve to wear away the silver plate, and render it necessary to incur the expense of replating, when, otherwise, this might be avoided.

FORMULAS FOR INJECTIONS.

182. Many of the formulas in this collection are simple, and may be employed by families with advantage in relieving the slighter ailments to which they are exposed, while others, as will be obvious, should only be used under the guidance of a physician. We have written the formulas in as plain English as we were capable, so that they might be readily understood. The quantity of fluid specified, is always intended for an adult, unless otherwise mentioned. The reader will have a better understanding of all that relates to the formulas, by referring, if necessary, to the following heads:

Weights and Measures,	page 69
Quantity of fluid for an Injection,	“ 71
Temperature of Injections,	“ 73
Directions for taking Injections,	“ 75

COMMON OR SIMPLE INJECTIONS.

FORM. 1.

183. Take of warm water, three quarters of a pint; or the same quantity of thin gruel; or water containing two tablespoonfuls of molasses.

These are always at hand, and may be used when it would be impossible to obtain any other form of injection. They operate partly by distension, and partly through the impression which the warm fluid makes upon the intestines. Repeat, if necessary,

until the bowels are evacuated. The warm water alone is probably quite as good as either of the other preparations.

184. Prout, in his work on the Treatment of Stomach and Renal Diseases, says, — “Much alleviation from the pain produced by renal concretions, (stones in the kidney,) is also sometimes obtained, by the free injection of warm water into the bowels. This remedy may be administered at first, with the view of clearing the bowels; and afterwards, if necessary, repeated with the addition of sedatives.”

FORM. 2.

185. *Injections of Soap and Water.* Take a warm and strong solution of Castile Soap, three quarters of a pint; or, take soft soap, a tablespoonful and a half, and warm water, three quarters of a pint. The first is more active than warm water alone; the second more active than either.

186. Prout, in the work just quoted, says, — “The shortest mode of getting rid of acidity of the lower bowels, is to inject a pint or two of warm water, or of soap and water. By this simple remedy, I have often seen the severe nervous headache, and other unpleasant symptoms, accompanying acidity in the lower bowels, immediately removed.”

FORM. 3.

187. *Oatmeal.* Take of oatmeal an ounce; water three pints. Boil to a quart, strain, allow it to stand till it cools, and then pour off the clear liquor from the sediment. This is a somewhat mucilaginous fluid, and in the quantity of a pint, forms an excellent injection. It may be rendered laxative by the addition of a tablespoonful, more or less, of common salt.

MUCILAGINOUS INJECTIONS.

FORM. 4.

188. *Slippery Elm.* Take of the elm, in powder, a heaped teaspoonful and a half; moderately hot water, three quarters of a pint. Sprinkle the powder over the surface of the water, and stir quickly and rapidly, so that the elm may not have time to agglutinate or form into lumps. In this way a uniform mucilage may be produced at once; and if too thick, (for its consistence depends upon the quality of the elm,) warm or cold water may be added, according to the temperature required.

189. If the powdered elm is not at hand, take of the bark, cut into shreds and bruised, an ounce; boiling water a pint. Steep two hours in a covered vessel and strain, or pour off the clear infusion.

190. This is one of the most valuable of the mucilages, and may be used with great advantage as a soothing or emollient injection in all irritable, painful, or inflammatory conditions of the large intestines, but particularly of the rectum. It is serviceable in diarrhœa and dysentery, and in the latter disease may be administered every hour or two, if necessary, as it will aid very much in relieving the pains and sufferings of the patient.* It is useful in evacuating the bowels in severe cases of piles, where an active or stimulant injection would be disagreeable or painful.

191. The elm injection, in common with all of the

* The late Professor Eberle seldom prescribed for dysentery without ordering the tea or infusion of elm to be taken in copious draughts, acknowledging that it has effected cures where all other remedies were unavailing. *Therapeutics*, 4th edition, p. 453.

mucilages, is a convenient vehicle for the combination of other and more active remedies.

FORM. 5.

192. *Starch*. Take of starch a tablespoonful, (three quarters of an ounce); rub into a thin paste with cold water; add three quarters of a pint of hot or boiling water, and stir a moment. The mucilage will be improved by allowing it to boil a moment. If too thick, it may be diluted with water, either hot or cold.

193. This is an excellent, soothing, and emollient injection, and may be used as Form. 4. With the addition of laudanum, it is the most common form of the *opiate or anodyne injection*. (Form. 18.)

FORM. 6.

194. *Flaxseed*. Take of flaxseed, unground, a tablespoonful, (half an ounce); water a pint and a half. Boil ten or twelve minutes; let it stand six or eight minutes; pour off the clear mucilage, or strain it through a thin cloth. Used as Form. 4.

INJECTIONS OF AROMATIC HERBS.

FORM. 7.

195. *Pennyroyal*. *Catnip*. *Spearmint*. Take of the dried herb of either of these plants, half an ounce; boiling water a pint. Steep in a covered vessel fifteen minutes, and strain.

The infusions or teas of these aromatic herbs are more efficient in evacuating the bowels than the same quantity of warm water; and are particularly useful in flatulent pains of the stomach and bowels,

or troublesome nausea, or vomiting. Being mild, they are well adapted to children. The pennyroyal is useful in hysteria, but it should be remembered that it disagrees with some people, causing headache, and other disturbances. Injections of these infusions may be repeated many times a day, if required.

FORM. 8.

196. *Wild Red Raspberry, (Rubus strigosus.)* — Take of the dried leaves of this plant, half an ounce; boiling water a pint. Steep fifteen minutes and strain. This furnishes an aromatic infusion, which is also moderately astringent. It is very useful in the bowel complaints of children, and for this purpose may be repeated frequently, if required. If the stools are painful, a teaspoonful of powdered elm may be stirred into the infusion, while it is warm, or moderately hot, as directed in Form. 4.

LAXATIVE INJECTION.

FORM. 9.

197. Take of common salt, olive or sweet oil, and molasses, each a tablespoonful; diffuse in three quarters of a pint of warm water. Usually very efficient. Each of the ingredients may be increased or diminished according to the activity of the injection. Many prefer to omit the oil, on account of the trouble it occasions in cleansing the syringe. The injection is active without it.

PURGATIVE INJECTIONS.

FORM. 10.

198. *Aloes and Soap.* Take of pulverized aloes,

two drachms ; soft soap, half an ounce, (tablespoonful) ; rub well together ; add a pint of water, and boil ten minutes. See next formula.

FORM. 11.

199. *Castor Oil and Turpentine.* Take of castor oil two ounces, (half a gill) ; spirit of turpentine, two teaspoonfuls ; gruel, or thin starch, (Form. 5,) half a pint. Rub the oil and turpentine together, and add the gruel or starch.

“ Either of these,” says Professor T. D. Mitchell, of Philadelphia, “ will be found very serviceable in obstinate constipation, and if need be, may be safely repeated several times in the course of a few hours.”

FORM. 12.

200. *Senna, Jalap, Cloves.* Take of powdered senna, one scruple ; powdered jalap, two scruples ; powdered cloves, fifteen grains ; or, instead of these, a drachm and a quarter (a large heaped teaspoonful) of the *cathartic powder* ; * boiling water, three quarters of a pint. Steep in a covered vessel until nearly cool enough to use, and strain.

201. A very useful injection in constipation ; also in fevers and inflammations in which a cathartic action is required, particularly if the stomach is too irritable to retain medicine. If a speedy evacuation of the bowels is required, it may be repeated every hour or half hour until the object is attained. In constipation, the injection may be repeated daily until

* *Cathartic Powder.* Take of the best senna, half an ounce, of the best jalap an ounce, and of cloves three drachms, all in powder. Mix well, and preserve in a corked bottle. For quantity, see Form. 12.

relief ensues. The senna and jalap may be increased or diminished according to the effect produced.

ASTRINGENT INJECTIONS.

FORM. 13.

202. *Logwood.* Take of logwood, rasped, half an ounce; water, two pints. Boil down to a pint and strain. A pint of this, milk warm, may be injected into the bowels, and repeated two or three times a day, in diarrhœa and dysentery, when the discharges are not painful, and are not accompanied with much inflammatory excitement. Logwood is particularly adapted to the bowel complaints of children when it is proper to use an astringent.

FORM. 14.

203. *White Oak Bark.* Take of this bruised, half an ounce; water a pint and a half. Boil to a pint and strain. Used in chronic and other diarrhœas, unaccompanied by pain or fever. In popular use also as a remedy in leucorrhœa. See *vaginal injections*.

FORM. 15.

204. *Tannin or Tannic Acid.* Take of tannin from ten to fifteen grains, and dissolve it in half a pint of warm water.

Tannin being the chief principle of vegetable astringents, and being also in a concentrated form, it is not only the most convenient, but probably the most efficacious, of the astringents in diarrhœa and dysentery. The solution may be used either warm or cold.

205. *Piles*, when they are sore and irritable, and

do not tolerate the ordinary injections, are greatly benefited by throwing a solution of tannin, in the proportion of the ten grains of the powder to two ounces of water, into the rectum at bedtime, so as to be retained all night. Five or ten drops of the tincture of opium may be added to the solution with advantage. The injection may be repeated every night, until relief is obtained.

206. *Prolapsus ani* is cured by the same treatment. The protruded bowel should be carefully washed, and returned by pressure with the fingers, kneading it in towards the centre, and inverting it like the finger of a glove. An ounce or two of the solution of tannin, of the strength recommended in the last paragraph, should then be thrown into the rectum and retained, repeating it once daily as long as required. In severe cases, the patient should remain in bed. We saw a boy recently in whom the intestine protruded six inches. During the evacuation of the bowels, the standing posture is preferable. A physician should generally be consulted in these cases.

207. *Uterine Hemorrhage*, — that is, hemorrhage or bleeding from the womb — which takes place after delivery, or during the pregnant period, has been successfully treated by injections of the solution of tannin. M. Dumars directs that *four scruples of tannin* be infused in a pint of boiling water, and injected slowly into the bowels.* Nothing is said of temperature, but it is usual to employ the solution cold or warm, according to the condition of the patient, — moderately cold, if she is hot or feverish ;

* Braithwaite, No. 7, p. 181.

or lukewarm, if she is chilly and exhausted. Half a pint of the fluid, however, will be more likely to be retained than a pint. To insure retention, it would be better in the first place to free the bowels with an injection of water.

SOOTHING INJECTIONS.

FORM. 16.

208. Take of scullcap, (*Scutellaria lateriflora*,) in powder, a teaspoonful; dried raspberry leaves, as in Form. 8, a quarter of an ounce; boiling water, a pint. Steep fifteen minutes, strain, and while the infusion is moderately hot, stir in a teaspoonful of powdered elm, as directed in Form. 4.

209. When the more active injections are followed by lingering pain, or uneasiness of the bowels, this one will frequently allay it, and produce a tranquil feeling throughout the whole system. It is beneficial in piles, recovery from dysentery, and in all cases in which there is soreness or irritability of the large intestines.

FORM. 17.

210. Take of lady's slipper, (*Cypripedium*, any of its species,) in powder, a teaspoonful; boiling water, half a pint. Steep in a covered vessel until nearly cool enough to use, and strain.

A gill of this may be given to a child five years old, and repeated several times a day, if necessary. It is a good nervine, and tends to quiet the restlessness and irritability of children. May be used for the same purpose in adults, particularly in case of nervous or hysterical women.

OPIATE OR ANODYNE INJECTIONS.

FORM. 18.

211. Take of starch mucilage, Form. 5, four ounces; laudanum, half a drachm, (equal to fifty or sixty drops, according to their size.) Mix well.

212. This is the officinal formula of the U. S. Dispensatory, accompanied with the remark, however, that, as the injection should remain in the rectum, the smaller the quantity of the vehicle the better, and adding — “The ordinary anodyne enema, employed in this country, consists of about sixty drops of laudanum and one or two fluid ounces of flaxseed tea or solution of starch.”

213. Dr. Martyn Paine directs only thirty drops of laudanum to four ounces of starch mucilage, while Druit, in his Modern Surgery, directs from sixty to one hundred and twenty drops.

214. Inasmuch as the same quantity of laudanum, or opium in any other form, will affect different persons in a different degree, it is well, undoubtedly, to commence with the smaller quantities, and to increase them if necessary. When the anodyne injection is intended to allay irritability of the rectum, bladder, urethra, etc., in the adult, we have already assigned a reason why the quantity of mucilage should not exceed two ounces, adding to it not more than fifteen drops of laudanum. (Par. 157.)

215. An opiate injection for an *infant a year old* may consist of two or three drops of laudanum, and from half an ounce to an ounce of the elm or starch mucilage. If the rectum is very irritable, it will not usually retain more than half an ounce of the mucilage. (Par. 154.)

216. Speaking generally of the opiate or anodyne injection, the United States Dispensatory says — “This is an admirable remedy in obstinate vomiting, strangury from blisters, painful affections of the kidneys, bladder, and uterus, and in the tenesmus* of dysentery. It may also frequently be employed to produce the effects of opium upon the system, when circumstances prevent the administration of this medicine by the mouth.”

217. Opiate injections are valuable in their place, but are capable of being abused, and should not, therefore, be frequently repeated without the advice of a physician.

ANTISPASMODIC INJECTIONS.

218. Antispasmodic remedies are those, properly speaking, which have the power of relieving spasms. They are used, also, for the relief of severe pains, unconnected with inflammation. They are principally employed in hysteria, colic, and the convulsions of children. In addition to the two following formulas, see also *stimulant injection*, Form. 22.

FORM. 19.

219. Take of warm water, or elm, or starch mucilage, (see formulas 4 and 5,) half a pint; tincture of assafoetida, two drachms, (two teaspoonfuls.) Mix well. Much used in hysteria, but is objectionable to some on account of the odor of the assafoetida.

* *Tenesmus* consists of an urgent desire to go to stool, with severe straining, but without any discharge. It is always referred to the lower portion of the rectum, just within the anus

FORM. 20.

220. Take of assafoetida, one drachm; camphor, ten grains; starch mucilage, (Form. 5,) half a pint. Rub the assafoetida and the camphor with the mucilage, and add half an ounce (tablespoonful) of the spirit of turpentine. (*Prof. T. D. Mitchell.*) Useful in hysteria, flatulent colic, etc.

INJECTIONS OF LOBELIA INFLATA.

221. We know of no injection that will at all compare with that of the *Lobelia inflata* in producing a prompt and efficient evacuation of the bowels. It increases the functional activity of the bowels in a remarkable manner, and thereby enables them to expel their contents. A given quantity of the lobelia, injected into the bowels, will produce an equal if not a greater effect upon the general system, than though it were taken into the stomach. Moderately used by injection, and given so as to be retained, physicians will find it particularly serviceable in allaying high febrile and inflammatory excitement, and hence it is a valuable auxiliary in the treatment of many acute diseases, as pleurisy, lung fever, inflammation of the brain, etc.

222. Dr. Livezey, in some remarks upon this subject, (Braithwaite, No. 16, p. 134,) says that in lessening vascular action in the febrile disorders of summer and autumn, the "nitrous powders," in comparison with *Lobelia inflata*, "sink into utter insignificance." In high vascular action, he adds, with disturbance of the brain, where "the application of cups to the nape of the neck, etc., fails in restoring rationality to the sensorium, (brain,) the most admirable

results follow the administration of an enema largely composed of the lobelia; and if accompanied with enervation, (reduction of the strength,) and subsultus tendinum, (twitchings of the tendons,) the efficacy of the enema will be much enhanced by adding pulverized valerian and tincture of capsicum, or camphor, which, when thus combined, produces a powerfully revellent action, changes the scene of excitement, and leaves the cerebral * functions free."

223. Lobelia, injected in full doses, will produce vomiting, accompanied by that peculiar relaxation which is so characteristic of the remedy. Pushed to this extent, it is often useful to the surgeon in reducing dislocations, etc. Dr. Livezey says,—“In strangulated hernia, and dislocations of the larger articulations, where great relaxation is necessary, a powerful enema of the plant, or of the bruised seeds, will fully answer the expectation of the medical attendant, being equally beneficial and much more safe than the tobacco injection used in the former difficulty, and it will take the place of venesection, tartarized antimony, and generally the hot bath, so universally recommended to overcome the rigidity of the muscular fibre."

224. Lobelia administered by injection is not only more decided in its action upon the general system; than when taken into the stomach, but also upon the kidneys, bladder, womb, etc., and therefore it may be thus employed with great advantage in inflammation of these organs, as also in retention of urine, spasmodic affections of the neck of the bladder, urethra, etc. For the same reason, *flooding* after childbirth is

* Relating to the brain.

often arrested very promptly by an injection of lobelia.

225. *Croup*. We must also quote the remarks of Dr. Livezey on croup, (*Braithwaite, No. 16, p. 134,*) because any remedy, or mode of treatment, which is likely to prove beneficial in this dreaded disease, is entitled to consideration. Speaking of membranous croup, the writer says that when vomiting cannot be readily produced, either on account of the nature of the disease, or from the unpleasantness of giving medicine to infants, the "difficulty may be obviated by enemata containing a portion of the tincture of lobelia, or of the pulverized plant, which at once relaxes the system, removes the tension of the chest, changes the seat of excitement to a distant part, and readily produces vomiting; the bowels meanwhile are emptied of their contents, and recovery from every distressing symptom immediately follows."

226. The *Lobelia inflata* is one of the more active remedies of the materia medica, and should, therefore, like any other active remedy, be used with prudence and caution. We confess that it has been much abused by a class of ignorant men, who have employed it as a sort of universal "cure-all," without having knowledge sufficient to tell whether the liver is an organ of the abdomen or chest. We are not aware, however, that this is a reasonable argument against the skilful use of it; and indeed, it is now very extensively employed by the medical profession both in the United States and Europe. As a general thing, it does not require to be administered in quantities sufficient to produce vomiting and relaxation; and short of this, we regard it as perfectly and entirely safe. In urgent or threatening cases of croup, we

should unhesitatingly give it in a sufficient quantity to produce vomiting, as Dr. Livezey has recommended; and also in prolonged convulsions, locked jaw, and other analogous cases. Where relaxation ensues, it generally subsides in an hour or two, or even less, leaving the patient not only relieved, but delightfully refreshed and invigorated. The only treatment required during the relaxation, is to keep the patient comfortably cool, and sponge his face, chest, and hands occasionally with cold water. This relaxation seems to have reference principally to the voluntary muscles, for the pulse, meanwhile, is generally regular, showing that the heart performs its functions in a healthful manner. There are only a few cases, so far as any danger is concerned, in which we would hesitate to employ lobelia in a sufficient quantity to occasion vomiting and relaxation; among these, are broken-down invalids, who are constantly cold or chilly; inebriates who are suffering from a debauch; and women who are laboring under painful disorders of the womb. Even in these cases, the injections may be used with safety and advantage to evacuate the bowels, if the precaution be observed to commence with a small quantity of the lobelia, and increase it, if necessary, so that it shall not produce any of the more decided effects of the remedy.

FORM 21.

227. Take of the dried herb of lobelia, in powder, a scruple, (level teaspoonful,) moderately hot water, three quarters of a pint. Steep until nearly cool enough to use, and strain, or pour off the clear infusion.

228. This will usually evacuate the bowels of an adult without a repetition. In many cases, half of this quantity of lobelia, or less, will suffice, while in others it requires to be increased. It is better to commence with the smaller proportions, as it is not intended that the injection shall produce vomiting and relaxation. The employment of the remedy occasions more or less pain of the bowels, for a short time, particularly if they are much diseased. In *fevers* and *inflammations*, it is better to retain the injection, and therefore the quantity of fluid should not exceed half a pint. It may be repeated three or four times in twenty-four hours, according to the judgment of the physician. The lobelia injection is useful also in hysteria, convulsions, and in all cases of an irregular distribution of the nervous force.

229. For an *infant a year old*, the injection may consist of a tablespoonful of the above infusion, (Form. 21,) and three tablespoonfuls of milk warm water. If this does not produce a sufficient evacuating effect, two tablespoonfuls of the infusion and two of water may be employed. In obstinate or threatening cases of croup, two ounces of the infusion, or more, may be required before an impression is made upon the system.

STIMULANT INJECTIONS.

FORM. 22.

230. Take of the stimulant tincture,* from a half to a whole teaspoonful, or more; warm water, three

* To prepare the *stimulant tincture*, take of the seeds of *Lobelia inflata*, well bruised or ground, two ounces; myrrh,

quarters of a pint. For an infant a year old, add from ten to twenty drops of the tincture to two or three ounces of warm water.

231. This injection is a prompt and speedy evacuant of the bowels, and is more convenient than the infusion of lobelia, (Form. 21,) inasmuch as it is always ready for use. Less than half a teaspoonful will be found sufficient in some cases. Like the lobelia infusion, it causes more or less pain for a short time, particularly if the bowels are much diseased, which is due to the energetic expulsive efforts which it occasions. The tincture may be graduated, however, so as to operate pleasantly and efficiently, without causing any pain or distress. The tincture may be increased so as to occasion vomiting and relaxation, as we stated of the lobelia inflata, but this is quite unnecessary, excepting in extreme or urgent cases. The injection is not adapted to piles when they are painful or irritable, nor to any of the painful or irritable conditions of the rectum.

232. Individuals who are rendered costive by sedentary habits, or severe mental application, and in whom injections of warm or cold water are inefficient, will find the stimulant injection of great value in thoroughly evacuating the bowels, and also in relieving, in many cases, the dull and heavy feelings of an overwrought brain.

bruised, one ounce; scullcap, (*Scutellaria lateriflora*,) half an ounce; African capsicum, a quarter of an ounce; alcohol, 80 per cent. one pint. Infuse for a week or ten days in a closely stopped bottle, shaking it two or three times a day; then express and filter. Keep the tincture tightly corked. The capsicum must be of African growth, and in no way adulterated. The capsicums of the East and West Indies operate harshly upon the bowels.

233. This injection is one of the most valuable of the antispasmodics, and may be used with great advantage in hysteria, convulsions, and all analogous cases. The quantity of the tincture employed must be regulated by the effect produced. In violent cases of disease, such for example as long continued convulsions, we have directed a tablespoonful of the tincture to be added to three quarters of a pint of warm water, and the injection to be repeated in the course of a few hours, if the relief was not permanent.

234. The stimulant injection is also a valuable remedy in croup, and is more prompt in its action than the infusion of lobelia. For a child five years old, twenty drops of the tincture may be added to four ounces or more of warm water, and the quantity increased to a half or whole teaspoonful, if the urgent and alarming symptoms do not yield.

235. We may further add, that the stimulant injection containing a teaspoonful of the tincture, and retained until strong expulsive efforts of the bowels are induced, is very serviceable, in many cases, in arresting hemorrhage or flowing after delivery, and also in causing the expulsion of the placenta or after-birth, when it is unduly retained.

FORM. 23.

236. Take of tincture of lobelia, two drachms; tincture of capsicum, a drachm and a half; tincture of valerian, one drachm; tincture of myrrh, half a drachm. Mix.

This formula, which any good druggist can put up, may be employed beneficially as a stimulant injection, adding about a teaspoonful of it to half a pint or a pint of water.

INJECTIONS OF TURPENTINE.

FORM. 24.

237. Take of spirit of turpentine, half an ounce, (tablespoonful); yolks of two eggs. Beat them well together, and add three quarters of a pint of warm water. Or, take of spirit of turpentine, the same quantity; olive or sweet oil, one ounce; beat or rub these together, and add warm starch mucilage, (Form. 5.) three quarters of a pint. Very useful in relieving the pains of colic. Employed also for worms, obstinate constipation, and flatulent distensions. Pereira quotes Dr. Montgomery as saying that the turpentine injection "is much used in peritoneal inflammation." Dr. Robert Dick remarks that "turpentine has a most cordially stimulating and corrective effect in loaded, torpid, foetid, and flatulent states of the cœcum and colon."

OLEAGINOUS INJECTIONS.

FORM. 25.

238. Take of mutton suet, well grated, an ounce, and boil it in a pint of milk. An excellent emollient injection, and one that has been very useful in dysenteric affections. *Professor Mitchell.*

FORM. 26.

239. Take of goose oil, a pint and a half. Heat the oil until it is as warm as new milk, and stir in half an ounce of Scotch snuff.

This is an odd and singular formula, but we have seen proper to introduce it, because it afforded wonder-

ful relief in a case of *painter's colic*,* in which other remedies had failed. The patient was a young man, engaged in the business of a painter, and had passed eight days and a half in great agony, being affected with nausea, vomiting, and the usually severe pains of the bowels. There had been no evacuation of the bowels during this period, notwithstanding the employment of a number of active cathartics, together with injections of various kinds, including a strong infusion of tobacco, which was administered in the quantity of twelve ounces, and frequently repeated. The vapor bath and warm bath were employed, with all sorts of fomentations. Nothing gave the slightest relief, and the stomach became so irritable as not to retain even a teaspoonful of water. The case, according to the judgment of several experienced physicians, was apparently hopeless, and as a last resort, the above injection was administered. In a few minutes, the pain wholly subsided, followed by a tolerably copious evacuation of the bowels, consisting of black, indurated masses, (*scybala*.) The vomiting and nausea also subsided, as though by a charm. The cure was completed by giving an injection, every six or eight hours, for a limited time, of goose oil in the quantity of twelve ounces, with half a teaspoonful of snuff. Each injection brought away a quantity of the aforesaid *scybala*, until the bowels were entirely

* *Colic* is a term applied to all griping pains in the abdomen, not arising from inflammation; the disease, nevertheless, is divided into several species. It is called *spasmodic colic*, when the pain is of a sharp and spasmodic character; *bilious colic*, when the pain is accompanied with vomiting of bile; *flatulent or windy colic*, when the pain is the result of flatus or wind; *inflammatory colic*, when inflammation is present, and *painter's colic*, when it has been produced by the action of lead upon the system.

relieved, and the patient restored to his usual health.*

FORM. 27.

240. Take of goose oil, three quarters of a pint; or the same quantity of the oil and warm water, in equal parts; Scotch snuff, a teaspoonful. Mix well, and inject milk warm. We are assured that this has proved very efficient in procuring an evacuation of the bowels in colic, where other injections have failed. It may be repeated every hour if necessary, though the repetition is seldom required. What virtue there is in goose oil over any other oil, we are not prepared to say.

INJECTIONS OF OX GALL.

FORM. 28.

241. Take of ox gall, † two ounces; warm water three quarters of a pint.

Dr. Clay and Dr. Alnatt, of England, both agree

* We have been taken to task by some of our water-cure friends, for the introduction of this formula, inasmuch as they consider the snuff objectionable. We beg to say, however, that we reported the case just as it was given to us, and if, by so doing, we should be instrumental in saving a single life, we should not consider the formula out of place in our little volume. It does not follow, because we have introduced the formula, that we would recommend the snuff, at least not in so large a quantity, and indeed it is a question with us, whether the oil, from the bland and soothing impression which it is known to make upon the bowels, would not be equally as efficacious without the snuff. We do not consider, however, that there is any hazard in using the quantity of snuff specified in formula 27, nor does it appear that the large quantity employed in formula 26, was other than beneficial.

† This may be obtained of the butchers and venders of beef in our principal markets. The contents of a gall bladder will fill a half pint bottle, which should be tightly corked.

that ox gall will speedily soften indurated feces,* and for this, and other reasons, they believe it to be a valuable remedy in constipation. The latter has reported a number of cases, treated by injections of ox gall, which would seem to confirm his views. *Braithwaite, No. 12, p. 91, and No. 13, p. 102.*

242. A woman three months advanced in pregnancy, was habitually constipated, and her stomach became so irritable as to reject all aperients. Warm water injections failed to relieve the bowels. Dr. Alnatt dissolved a drachm of *insipissated ox gall*† in a pint of warm water, and directed that it should be thrown into the bowels. "The relief was instantaneous; a mass of scybala was expelled which had evidently lain impacted in the colon."

243. A young lady had been obstinately constipated for a fortnight. She had taken drastic purgatives, which produced pain and vomiting, accompanied with ineffectual attempts to pass an evacuation. The lower portion of the intestines was evidently impacted with scybala. Injections containing turpentine were first administered without relief. *Two ounces of ox gall*, with half a pint of thin gruel, were next thrown into the rectum. The exterior parts of the hard mass were immediately dissolved, and in ten or fifteen minutes the whole was ejected, and the symptoms were instantly relieved.

244. A lady, seventy-seven years old, was sinking

* Warm water, alone, will soften indurated feces in a very short time.

† Take the healthy gall of a young ox, and evaporate it in a large flat dish, in an oven, at 96 degrees, or less, to the consistence for making hard pills. The *insipissated gall*, thus formed, is to be dissolved in hot water or thin gruel, when required for use.

from unrelieved constipation. Excrementitious vomiting had taken place, and the powers of life seemed waning. Dr. Alnatt advised, as a last resort, a warm injection of ox gall and turpentine, with thin gruel, to be vigorously injected as far as possible into the intestines. In less than half an hour a mass of scybala was expelled, the exterior portions of which had been imperfectly softened by the action of the gall. Other portions followed speedily, and convalescence was the result.

INJECTIONS FOR WORMS.

245. The intestinal worms most frequently noticed are the *long round worm*, and the *thread, maw, or pin worm*. The first is six inches to a foot in length, and inhabits the small intestines. Occasionally it creeps upward to the stomach. The maw or pin worm does not exceed half an inch in length, and is found principally in the rectum, where it causes an itching and distressing sensation. It afflicts children principally, but is found also in adults. Pin worms exist sometimes by the thousand, and being in the rectum, are treated advantageously by injections.

FORM. 29.

246. Take of wormwood, half an ounce; boiling water, three quarters of a pint. Steep fifteen minutes and strain. Administer in the quantity of half a pint. Or, take of aloes, a scruple and a half; carbonate of potash, fifteen grains; warm water, half a pint. Mix, and rub them together. Either of these may be repeated daily, until the worms disappear. It is desirable that the injection should be retained for some time. The quantity of fluid is to be varied with the age of the child.

FORM. 30.

247. Take of bayberry, (*Myrica cerifera*,) in fine powder, a teaspoonful, water half a pint. Boil ten minutes and strain. The whole of this may be given to a child five years old, injecting it slowly into the bowels. Usually, it is not long retained. Given at bedtime, the child will generally go to sleep, instead of continuing restless and fretful through the night. This injection seems to be more efficacious than that of the aloes, which is mostly used for the cure of pin worms. It may be repeated twice a day for a few days, if necessary.

INJECTION OF YEAST.

FORM. 31.

248. Take of yeast, from a half to three quarters of a pint. Useful to correct the offensive odor of the stools in dysentery, or other disease. May be found serviceable also in typhoid fevers, in which yeast has been employed with much advantage by the stomach.

INJECTION FOR DRUNKENNESS.

FORM. 32.

249. Take of common salt, two tablespoonfuls; warm water, a pint and a half. Dr. Lalaux, of France, asserts that this will dissipate the serious symptoms of intoxication. It causes a formidable shock to the system, after which all the functions resume their play. It has the advantage, he says, over ether and ammonia, of always being at hand; and in a case of drunkenness observed by him, it proved to

be more powerful than ammonia in causing the cessation of the stupor which succeeds intoxication by alcohol. — *French Journal. Vide. Bost. Med. and Surg. Jour.*

NUTRITIVE INJECTIONS.

FORM. 33.

250. Take of strong beef tea, a pint ; or the same quantity of any other nutritious and appropriate fluid. This may be employed two or three times daily, or according to the requirements of the system. An interesting case is related in the *Medico-Chirurgical Review* for Jan. 1847, in which life was sustained for forty days by nutritive injections. The patient was a young man, twenty years old, who took daily, in three injections, two pints of broth made from rather more than a pound of beef. His hunger was always appeased by the injections. When his bowels were confined, some salt was added, which was sufficient to open them. Once, some wine was added to the injection. On the 41st day, food was given by the mouth, the man looking well, and in tolerably good condition.

INJECTION FOR CHOLERA.

FORM. 34.

251. Take of powdered cubebs, half a drachm ; starch mucilage, four ounces. Mix.

This injection, says Dr. T. B. Page, of Louisiana, in a letter to the *Boston Medical and Surgical Journal*, is recommended by Dr. Carquet, and has, in many instances, removed, as by enchantment, all the grave symptoms, without causing either pain or too

great reaction. If there is coldness and sinking, the writer adds, the patient's body and limbs should be enveloped in a blanket saturated with very hot water, and kept in it till warmth and circulation are restored. The writer has reference to true Asiatic cholera, accompanied with prostration, vomiting, and the characteristic purging, and recommends the treatment to arrest the discharges as soon as possible, and restore heat and circulation, together with the respiratory powers.

INJECTIONS OF NITRATE OF SILVER.

252. The evident value of nitrate of silver as a local remedy in diseases of the throat, and many other affections, has led to its employment in the form of injections in some intestinal diseases, and we feel unwilling to publish the second edition of our little volume, without saying at least a word upon the subject.

253. Among the first who used it to any extent in the form of injections, so far as we know, was Dr. E. Hare, who prescribed it in the dysentery of India, dissolving 15 grains of the nitrate of silver in two and a half or three pints of water. He found this particularly useful. He says,—"No doubt the nitrate of silver might be much increased in strength, but I have not been able yet to ascertain how much, from a dislike to try dangerous experiments without extreme caution. It is absolutely necessary to clear out the bowels with a large injection, before injecting the medicinal one, which may be smaller." *Braithwaite, No. 20, p. 91.*

254. In Braithwaite, also, No. 18, page 124, a

case is related of a woman, 45 years old, suffering from dysentery of five days continuance. The symptoms had been relieved, but there still remained seven or eight bloody and painful discharges per day.

255. "The following injection was ordered:—Crystallized nitrate of silver, 25 grammes, (400 grains); water, 200 grammes, (nearly 7 ounces); to be used as follows: After each injection of the solution, another injection of about 300 grammes, (10 ounces,) of tepid water immediately to be given, in order that the nitrate may be conveyed high up into the intestine, and come in contact with a larger extent of surface."

The next day the amelioration was remarkable. During convalescence diarrhœa occasionally set in, but was always immediately controlled by the injection of the nitrate of silver, followed the next day by an injection of starch.

This was heroic treatment, and had it not taken place at a French Hospital, we should not be disposed to believe it. Indeed, the quantity of nitrate is probably a misprint. Nitrate solutions of 40, 50, and even 100 grains to the ounce of water, are applied to the throat, vagina, neck of the womb, &c., but this, it seems to us, is very different from bringing a strong solution in contact with a considerable portion of the intestinal canal.

256. Boudin, Physician to the Military Hospital at Marseilles, prescribed for fifty cases of typhoid fever, in most of which severe diarrhœa was the prominent feature, and in many of them, in which the lower portion of the intestinal tract was presumed to be the seat of ulceration, he employed injections containing from one to three grains of nitrate of silver

dissolved in six ounces of water. In most of these cases, one injection sufficed, the symptoms undergoing speedy amelioration.

257. A writer in the London Medical Times, (see Braithwaite, No. 18, page 123,) calls attention to the value of nitrate injections in chronic dysentery, in which the large intestine is the primary seat of ulceration. The decided effect which the nitrate has produced in these cases, he says, when the other popular astringents were of no avail, speaks loudly in favor of its employment, and, he adds, that if experience should prove the nitrate as useful generally in those chronic forms of diarrhœa, which are so perplexing to the practitioner, as he has found it in a few cases, it will be a valuable addition to our present list of remedies.

258. In using the nitrate injections, we would advise a solution of from three to five grains to a quart of pure, soft water, by way of commencement, premising that it is not necessary to use distilled water; and if this should produce but little pain or distress, beyond that incidental to the temporary distension of the bowels by the fluid, the quantity may be gradually and safely increased, if this should seem desirable. The quantity of the fluid injected, will of course depend upon the nature of the case. If the disease or ulceration is not higher up than the pouch of the rectum, two ounces will be sufficient, but if it involves the greater portion of the large intestines, then from one to three or four quarts may be required. Care should be taken not to stain the linen or bedclothes unnecessarily. Either the common nitrate of silver of the U. S. Dispensatory, or the crystallized nitrate may be used, but the latter is

usually preferred in consequence of its greater purity. A weak solution of four or five grains to the quart of water, may be used with a Britannia syringe, without much discoloration, if the instrument be washed immediately with pure water; but if the solution is of much greater strength, it is better to employ a silver-plated instrument. The nitrate injection, let it be remarked, should always be preceded by a large one of tepid water, to evacuate the bowels.

259. Dr. Heaton, of this city, recently treated a lady with scrofulous ulceration of the bowels, in which he employed weak nitrate injections in the proportion of five grains of the crystals to a quart of water. From two to three pints of this solution was injected at a time, preceding it with a water injection to free the bowels. It was usually retained about ten minutes, and caused very considerable pain, which would continue for several hours, when a tranquil state of the system would ensue, followed by sleep. He repeated this injection twice a week for four weeks, when a decided improvement had taken place, and he was only deterred from using it more frequently and for a longer period, from his own fears, as well as those of the patient, of discoloration of the skin.

260. *Discoloration of the Skin Considered.* With regard to discoloration, we believe that this has only taken place where the nitrate has been used internally for a long period. Professor Dickson, of South Carolina, stated some years ago, that three months was the shortest recorded time in which the internal use of it had produced discoloration of the skin. Dr. Branson, of Sheffield, England, has observed that when the nitrate has been taken for some

time, it gives rise to a blue line on the edge of the gums close to the teeth, similar to that produced by the action of lead. He regards the first faint appearance of the blue line as a proof of the action of the medicine, and the depth of the color of the line as affording a very useful warning that the limit is reached beyond which it is unsafe to proceed.

261. *Opinions of Dr. Horace Green.* Since the above was in type, we have received an interesting letter from Dr. Horace Green, of New York, in relation to discoloration by the nitrate. Knowing that some members of the profession were unduly cautious, as we believed, in the use of nitrate of silver internally, lest it should cause discoloration, we addressed a letter to our friend Dr. Green, requesting his views upon the subject, believing that his authority would be decisive with the generality of the medical profession. We take great pleasure, therefore, in giving a place to Dr. Green's letter, which is as follows:

262. "On the subject of 'discoloration of the skin,' from the internal use of *nitrate of silver*, I can say, that although I have used the remedy very freely, not only in topical applications to the mucous membrane of the air-passages, &c.; but administered it internally, in diseases of the mucous membrane of the alimentary canal, yet in no instance, in my own practice, has such an event ever occurred. I have heard of one or two cases, where its injudicious employment, as a topical remedy, had been continued for a period of twelve or fourteen months, in which discoloration of the skin was induced. When given by the stomach, I seldom continue its daily use for a period longer than six weeks or two months, without intermitting the medicine for a time. In

doses of from one eighth, to one fourth of a grain, administered twice or thrice a day, the nitrate of silver may be given for two months without incurring the slightest risk of producing discoloration. Indeed, Sir James Johnson asserts, in his 'Essay on the Morbid Sensibility of the Stomach and Bowels,' that there is not an instance on record, where the complexion has been affected by the medicine, when restricted to three months' administration. When used as an injection, I am confident the remedy, if required, may be employed for a period much longer than the above, without endangering, in any degree, the complexion of the patient."

LARGE INJECTIONS.

263. Dr. Hall, of Glasgow, Scotland, in consequence of some eminent practitioners doubting whether injections could be made to pass through the sigmoid flexure of the colon, (plate III. p. 25, letter *P*), "commenced a series of experiments on dead bodies, to decide this important practical question." * In his first experiment, he injected into the bowels five or six pints of thin gruel, and on examination, it was found to have even passed the ileo-cæcal valve. (See plate III. as above, letter *J*.) In another experiment on a dead body, eight pints of water were injected, and it was found to have passed not only through all of the intestines, but also partially into the stomach.

264. Previous to these experiments, Dr. Hall was called to an emaciated old man, said to be laboring under strangulated hernia. The pulse was rapid, the bowels had been confined for ten days, and for two days there had been vomiting of fecal matter. There was a hard tumor in the right groin, supposed

* Braithwaite, No. 13, pp. 97-8.

to be the strangulated intestine, but it was found to be an enlarged gland of fourteen years standing. Dr. Hall proceeded to administer a purgative injection, of from two to three quarts, which the patient retained for twenty minutes, at the end of which time the greater part of it was voided, slightly tinged with feculent matter. Three hours after this, there was another and a very copious stool, consisting of dark colored, most offensive, and nearly solid feces. At the next visit of Dr. Hall, instead of finding the patient in a dying state, as he expected, he was surprised to learn that a great improvement had taken place. The vomiting had ceased, and the pulse, which, before the operation of the injection, was so rapid and feeble as not to be counted, was now below a hundred, and possessed much more strength. From this time, the man continued to improve until he was fully restored to health.

265. Dr. Hall remarks that this case ruled his procedure in all subsequent cases of obstinate constipation, not dependent upon recognized strictures, strangulated hernia, or abdominal tumors; and he expresses himself highly gratified with the successful issue of the practice.

266. The second case reported by Dr. Hall was that of a gentleman 82 years old, in whom the bowels had not been properly opened for ten days, and in whom percussion indicated a collection of indurated feces in the cœcum and colon. Ordinary sized injections had been used for two days, but without producing any relief, and it was then decided to employ large injections. Dr. Hall says, — "I threw up five pints of oleaginous gruel, having previously dissolved in it an ounce of sulphate of magnesia." (Epsom salt,) 'and a tablespoonful of common salt.

The administration of this large quantity of fluid occupied twenty minutes; for it is highly important that the process should be conducted as slowly as possible. (Par. 172.) "The patient, after the first two or three pints had passed, could trace, by his sensations, the progress of the fluid even as far as the cœcum; the sense of distension was at times almost insupportable. I, however, prevailed upon him to retain the injection for nearly twenty minutes, so that the contraction of the distended bowel might become more general, and the evacuation more complete. Dark, almost black, scybalous masses, highly offensive, and of the most diversified shape, sufficient to fill a pint measure, came away, affording marked relief to my patient. The vomiting and hiccup ceased, and the pulse fell to the natural standard, followed by sound sleep. The next morning, he had a strong desire for food, which he retained upon his stomach." On the second day from this, another injection of like quantity and quality was administered, which brought away still more of the blackish scybala, and from that time the patient rapidly improved.

267. We will quote another of Dr. Hall's cases, on account of its interest in a practical point of view. "The patient was a stout man, in whom the whole of the colon gave a clear sound on percussion. He was placed on his *left side*, and three pints of fluid injected into the bowels; now there was dulness on percussion, (see note, page 55,) as far as the point where the transverse joins the descending colon. The man was then placed on his *right side*, and three pints more injected; within a few minutes he went to the water-closet twice, and after the second time, percussion indicated the presence of fluid as far as the sigmoid flexure of the colon."

268. This case will show, what must be very obvious upon reflection, that in the administration of large injections, the patient should lie upon his right side, with his hips elevated, as thereby the fluid will find its way more readily into the ascending colon and cœcum. See plate p. 25.

269. Dr. Hall informs us that the injected fluid passed the ileo-cœcal valve in the living as well as the dead subject, and we have also the statement of Boudin, physician to the Military Hospital at Marseilles, who treated fifty cases of typhoid fever with injections of the solution of nitrate of silver, that "there was evidence of the solution administered per rectum having passed the ileo-cœcal valve, and producing effects on the lower portion of the ilium precisely similar to those resulting from its action on the surface of the colon."

270. It has usually been denied that any fluid can pass through this valve into the small intestines, and it is probable that the cases here cited are to be regarded as exceptions to the general rule.

271. In the use of large injections, Dr. Hall gives the preference to "well boiled oat-meal gruel, with a certain admixture of common salt and butter." He regards this as the best form of purgative injection, from the fact that it has answered a better purpose in his hands than any other. He says, "it possesses mucilaginous and lubricating properties, which render it especially valuable in all forms of obstructed bowels, combined with a stimulating, solvent, and aperient action, (from the common salt it contains,) constituting it an excellent substitute for the *bile*, which latter," he adds, "cannot pass into the seat of the obstruction, in these cases, to stimulate the peristaltic action."

LARGE INJECTIONS CONTINUED — RECTUM TUBE.

272. There are many cases of disease, accompanied with obstinate constipation, in which ordinary injections do not procure an evacuation of the bowels, and therefore do not afford relief; and in which, also, the *large injections*, mentioned in the last section, are unavailable in consequence of the contracted and impervious state of the rectum, adjacent to the sigmoid flexure, (par. 102,) or because the flexure itself is so loaded or distended with fecal matter, as to prevent the passage of a fluid through it into the colon. The facts connected with this interesting topic, will be found detailed in the section entitled, "Where do the feces accumulate?" From the views there expressed, which are those of Dr. O'Beirne, it will be seen that *constipation*, with a few exceptions which are mentioned, is dependent upon a preternaturally contracted state of the rectum; and that in effecting a cure, it is necessary to dilate the rectum mechanically, so as to open a communication with the colon, and thereby enable the large intestines to expel their contents.

273. To accomplish this, it is necessary to introduce a gum elastic tube through the rectum into the sigmoid flexure, and after the usual escape of flatus and fluid feces, to adapt a proper syringe to the tube, and inject such purgative or other fluids as the case may seem to require. Dr. O'Beirne recommended this mode of treatment to the medical profession in 1833, when he published his book upon the subject, and he tells us that he had previously tested it for nine years, with the most unexampled success, in almost every variety of disease attended with constipation, frequently embracing cases of the most des-

perate character, in which all other remedial means had completely failed.

274. *Use, etc., of the Rectum Tube.* This tube, as it is now manufactured, is two feet or more in length, composed of an elastic material, and is similar to the tube of a stomach pump, excepting that its terminal extremity has only a single perforation. "If kept in a warm place, it will not be sufficiently stiff for the purpose required, and is liable to become doubled on itself in the act of introduction. Whenever this occurs, it should be placed for a few minutes in cold water, and afterwards in a current of air, until it acquires the necessary degree of stiffness." The extremity of the tube should be well oiled before it is introduced.

275. The patient being on his left side, with his knees drawn up, "the point of the tube, directed by the forefinger of the right hand, is to be introduced into the anus, which is often so tightly constricted as to make it a matter of some difficulty, and to require some force to effect its insertion. This accomplished, the instrument is to be firmly pressed upwards, inch by inch, and as nearly as possible in the course of the intestine. If the expulsive efforts be violent, which will occasionally happen, it will be advisable to yield to them somewhat, and take advantage of their intermissions to pass the tube higher and higher. When it has reached the height of eight or nine inches, the opposition to its further passage will be considerably augmented; but instead of yielding to it, the pressure upward must be gradually increased, until the resistance is completely overcome; at this moment, the point of the tube passes rapidly onward, as if through a very narrow ring, and the escape of either flatus or

fluid feces, or of both, takes place, giving the patient more or less relief, and assuring the operator that the upper extremity of the tube has entered the sigmoid flexure.* But if neither flatus nor fluid feces should escape at this time, he may be assured that the instrument is embedded in a mass of solid feces." This is obvious from the unusual difficulty which is experienced in discharging the contents of the syringe, "and the tube, on being withdrawn, will be found to have its cavity blocked up, and several inches of its surface coated with feces."

276. The rectum tube being introduced into the sigmoid flexure, the next step is to couple it with the terminal tube of the syringe, which may be done by pressing the latter into the larger or cone-like extremity of the former, and then the contents of the syringe may be discharged into the colon. The force necessary for this is quite moderate, excepting where the tube is embedded in a mass of solid feces, as just mentioned, and even then, according to O'Beirne, the resistance readily gives way before the impetus of the injected fluid.

277. When the full quantity of fluid is injected, the tube is to be slowly withdrawn, and it rarely happens that this is not followed by "a copious, or perhaps an enormous stool." Previous to the withdrawal of the tube, the patient should be instructed to resist his inclination to evacuate the bowels.

278. Ideas of pain and danger, says Dr. O'Beirne, naturally associate themselves with this operation, but

* Dr. O'Beirne alleges that the resistance encountered at the upper extremity of the rectum, is much greater in persons of an irritable constitution, than in any other class of patients.

a long and extensive experience enables him to assert, that what the patient suffers scarcely deserves the name of pain, and that the danger is altogether unfounded and imaginary. He feels himself warranted in using "very considerable force to effect the complete introduction of the tube," but this, he says, does not presuppose the employment of that "extreme or brute force" which would be likely to injure the intestines.

279. There are rare cases to which the remarks of our author do not apply, such for example as *schirous* * of the rectum, in which the parts are easily lacerated, but not susceptible of dilatation.

280. It should not be inferred that the introduction of the tube is invariably a difficult operation, for in many cases it is accomplished with great ease. In truth, Dr. O'Beirne was occasionally in the habit of directing his female patients to introduce it themselves, to the height of about ten inches, and then to throw into the bowels some appropriate fluid by means of a self-injecting syringe.

281. Dr. E. Hare, whom we are happy to quote,† and who used the rectum tube very successfully for five years in India, in the treatment of dysentery, introducing it above the sigmoid flexure as directed by Dr. O'Beirne, and injecting tepid water into the bowels, remarks, that "it is by no means necessary, in all cases, to introduce the elastic tube far up the intestines, although the inconvenience to the patient attending it, even in the worst cases, is so trifling as to make it almost a matter of indifference, if carefully

* This term is usually applied to the first stage of cancer.

† Braithwaite, No. 20, p. 91.

done." Dr. Hare further remarks, that "after the first clearing of the intestines," the introduction of the tube for *four or five inches* will suffice, and as the treatment progresses, he tells us that the "*common short rectum pipe*" will answer every purpose. It is undoubtedly true, as may be inferred from the remarks of Dr. Hare, that after opening a communication with the colon by means of the rectum tube, the syringe will be all-sufficient in most of the cases, without further aid from the tube, to inject any desirable quantity of fluid through the sigmoid flexure into the colon.

CASES TREATED BY DR. O'BEIRNE.

282. Dr. O'Beirne has furnished records of a large number of interesting cases which he has treated, including a variety of diseases in which obstinate constipation was a prominent symptom; and we have deemed it proper to quote a few of these in an abbreviated form, to show the practical value of the treatment in question.

283. RETROCEDENT GOUT. A lady aged 40, of full habit, and subject to gout, was attacked with painful swelling of the knees, etc. The next day this swelling subsided, but was followed with intense pain in the region of the stomach, followed by vomiting. Pulse quick, weak, and small; extremities deadly cold. The case was regarded as a transfer of gout to the stomach — patient's life appeared to be in imminent danger. Brandy, ether, laudanum, and water of ammonia, were all given, separately or combined; hot flannel, etc., were applied to the stomach and feet,

but without any relief. A strong fetid turpentine enema was administered with a common syringe, and twice repeated in quick succession, but without procuring a discharge from the bowels. The most appropriate treatment, diligently followed up for two days, failed to assuage the pain or produce a discharge from the bowels. Her life was now despaired of, and as a last resort, an injection composed of a large proportion of electuary of scammony and jalap, extract of colocynth, turpentine, assafoetida, and sulphate of magnesia, (Epsom salt,) was employed. Great force was required to discharge the syringe, and when this was done, the injected fluid passed off by the anus as fast as thrown into the rectum. Suspecting "an imperviously contracted state of the rectum," Dr. O'Beirne suggested the introduction of an elastic tube as the only means of saving the patient's life. To this she assented. Being placed on her left side, "a gum elastic catheter, of the largest size, was passed two inches up the rectum, where its progress was opposed by strong expulsive efforts, which lasted for a few seconds, then relaxed, and again was renewed. By first yielding to these efforts, and then taking advantage of the succeeding relaxation, the tube was gradually passed to the height of seven or eight inches. At this point, the resistance was much greater than at any other; but instead of yielding, the instrument was pressed more firmly upwards. Having steadily continued the pressure for about a minute, the resistance suddenly gave way, the tube passed forward, as if through a narrow ring, and, at the same moment, an uninterrupted stream of serous fluid issued rapidly from the tube, and continued to flow until three imperial pints, if not more were discharged.

From the moment that this unexpected discharge commenced, the patient experienced decided and general relief; and long before the discharge had ceased, the sudden change and improvement in her countenance were quite magical. During this and the succeeding day, the same kind of fluid, unmixed with fecal matter, continued to pass off slowly, and in a few days more, by the aid of generous diet alone, she was restored to her usual health."

284. SPINAL IRRITATION, ETC. A young lady, nineteen years old, had been injured by stays. She began to suffer with pains darting from the stomach to the sixth, seventh, and eighth dorsal vertebræ, coming on after meals, and the dread of them would often induce her to abstain for a long time from food. At length, she became obstinately costive, and would almost immediately vomit up every thing she ate or drank. Finally, it was found impossible to procure any discharge, even of flatus, from the bowels, and she began to suffer dreadfully from spasms of the neck, throat, shoulders, abdomen, and hips, with an intense burning in her stomach. She felt universally cold, and would scream out with pain on taking any kind of cold drink. She was leeches and blistered; injections of warm water, or warm water with castor oil, tincture of assafoetida, and Epsom salt, were frequently administered with a common bag and pipe. In the next place, she took an ounce of fluid mercury, (quicksilver,) and repeated it in eight hours, but it produced no discharge from the bowels, nor other effect, except a salivation, which came on in three or four days.

285. Finally, she applied to Dr. O'Beirne, who found that notwithstanding purgative draughts, the

fluid mercury, and nearly one hundred injections of various kinds, she had not had a stool, nor even a discharge of flatus from the bowels, for nearly six months. She could not sleep, was greatly debilitated, and for two months had vomited up every thing she swallowed.

286. Dr. O'Beirne prepared an injection, consisting of a pint of warm water, two drachms of tincture of assafoetida, two ounces of olive oil, the same quantity of Epsom salt, and an ounce of oil of turpentine. He then introduced a gum elastic tube into the intestines to the height of nine or ten inches, but with greater difficulty than usual. No flatus escaping, the tube was withdrawn, when its cavity was found to be blocked up, and two inches of its upper extremity covered with solid feces. It being clear that the sigmoid flexure contained a mass of solid excrement, the tube was again introduced, which required the same degree of force as in the first instance. Still, no flatus passed off. The syringe was now adapted to the tube, and the whole of the injection thrown up, when the tube was removed, and in less than two minutes, one of the most enormous stools was passed that our author had ever seen; it was solid, perfectly natural in appearance, and arranged in remarkably thick coils. She felt greatly relieved from the spasms of the stomach and bowels which had so long troubled her, but complained of great weakness, and to remedy this, a broad calico roller was drawn tightly round the abdomen.

287. Several months passed with only a partial amelioration of her symptoms, when it was found that "there was an unusual degree of tenderness on pressure over the spinous processes of all the dorsal

vertebræ from the sixth downwards," and local treatment being adopted to relieve this condition, she soon began to improve, and was enabled to retain nourishing fluids in her stomach. "From this moment, also, the rectum ceased to give any unusual opposition to the introduction of the tube, and the necessity for introducing it occurred much less frequently, and soon after ceased to exist." Natural sleep returned, and by degrees the patient was restored to robust health, without any tendency whatever to constipation.

288. *Remarks.* In connection with this case, it is observed that irritative states of the spinal marrow act upon the rectum, and cause it to become powerfully constricted; in this condition, therefore, the accompanying constipation is obstinate in proportion to the force of the constriction, and an attempt to introduce the tube is attended with more than the usual difficulty; but by removing the spinal irritation, the introduction of the tube becomes a comparatively easy matter. See note, p. 116.

289. *MANIA.* A young woman aged seventeen, in whom the menses had been suppressed for some time, attempted to commit suicide. She became, at length, so violent and maniacal as to require restraint. Her bowels being confined, large and repeated doses of calomel and cathartic extract were given, together with a variety of active purgatives, but without any effect. Croton oil was then given in three drop doses, and frequently repeated, but without moving the bowels. Injections consisting of infusion of senna, electuary of scammony, tincture of jalap, oil of olives, oil of turpentine, and sulphate of soda, were also employed, but to no purpose. The

constipation having existed obstinately for seven days, and the pulse being feeble and intermitting, with low muttering delirium, it was decided to pass the tube of a stomach pump up the rectum which was accomplished with some difficulty. "As soon as it reached the height of seven or eight inches, a loud burst of flatus, followed by a great and continued flow of liquid feces, took place through the tube, and produced immediate, decided, and general relief. As the bowels continued to act for nearly two hours after the tube was removed, no injection was thrown up, nor medicine of any kind ordered." This occurred about midnight, and during the remainder of the night, she slept soundly. The next morning her strength was nearly recruited, and the delirium nearly or quite gone. From this period, her improvement was rapid, and she recovered perfectly.

290. ENTERITIS OR INFLAMMATION OF THE INTESTINES. A physician, between fifty and sixty, was attacked with symptoms resembling enteritis, to which he was subject, and which caused him much alarm. He complained of severe pain in the lateral abdominal regions. He wished particularly to be bled, but Dr. O'Beirne advising to the contrary, it was agreed to introduce the tube of a stomach pump as far as possible into the intestinal canal. When it had reached its full limit, which was a distance of two feet, a gallon of gruel, containing some common salt, and four ounces of castor oil, was pumped through it into the colon. Immediately on withdrawing the tube, the patient hurried to the night chair, and discharged an enormous quantity of hardened feces. The relief was instantaneous, and our author says he was quite convinced that medicine alone could not have restored the action of the bowels.

291. COLIC.* “In colic,” observes Dr. O’Beirne, “it has been shown that the ilium, cœcum, and sigmoid flexure are generally distended with solid and fluid feces, and the intermediate portions of the colon with flatus. It occasionally happens, however, that the sigmoid flexure does not contain either solid or fluid matter, and that the whole of the colon is distended by air. Under such circumstances, to administer purgatives by the mouth, is only to increase the already irritable state of the stomach, to add to the distension and general suffering, and to attempt acting upon the seat of obstruction at the greatest possible distance from the same, and in the least practicable direction and manner. It is to be hoped, therefore, that practitioners will henceforth abandon this very injurious and unscientific mode of treatment; that they will direct their first efforts to the evacuation of the large intestines, and that they will then, and then only, have recourse to purgatives administered by the mouth.† Precisely the same may be said of enteritis.”

* For the different forms of colic see note, page 99.

† We have known many severe cases of colic to be cured by injecting warm water into the bowels, to the extent of three or four pints, more or less, the injection being continued slowly until the distension became insupportable, and the patient insisted upon going to the night chair. During the injection, also, draughts of warm water should be taken freely without particular regard to quantity, and by the vomiting thus induced, together with the copious evacuation of the bowels, the sufferings will be almost instantly relieved. The vomiting may precede, accompany, or follow the evacuation of the bowels. The draughts of warm water should never be dispensed with in the severe or aggravated forms of the disease.

292. TETANUS. One form of this disease is well known to the public as *locked jaw*. O'Beirne says — "Constipation of a peculiar obstinate character, is one of a number of symptoms which never fail to attend genuine tetanus. In fact, it has yielded so rarely to any of the means hitherto employed, that it is generally considered one of the greatest obstacles to the successful treatment of the disease. But it affords me great and unmixed pleasure to be enabled to assure the reader, that the introduction of the tube never fails in overcoming it, and that it effects this object as expeditiously as in less violent diseases." *

293. HYSTERIA. A lady, twenty-five, robust and florid, was laboring under a severe form of hysteria, in which she lay rigidly extended and unconscious for nearly the whole day. Obstinate constipation had existed for six days. The most active measures were employed to produce an evacuation of the bowels, but without success. On introducing the elastic tube, which was accomplished with great ease, some flatus escaped on reaching the colon. A large turpentine injection was thrown into the bowels, and was almost immediately followed by an immense discharge of solid and liquid feces. The patient was quite well in a few days. See *stimulant injection*.

294. DYSENTERY. The views of Dr. O'Beirne, in relation to this disease, are entitled to some consideration on the part of physicians, inasmuch as dysentery is not only a painful, but sometimes a fatal malady. He asserts that during the irritative and inflammatory stages of the disease, the rectum becomes unusually

* The stimulant injection is a valuable remedy in tetanus. See Form. 22, page 95.

and powerfully contracted, (par. 102,) and that as a consequence, there is complete retention of the contents of the bowels, with the exception of small quantities of flatus, blood, and mucus. The cœcum and colon soon become distended with fecal matter, which is not permitted to escape in the usual way, and accordingly, the great curative indication is to give exit to this accumulated matter by means of the rectum tube, introducing it into the sigmoid flexure of the colon.

295. *Case of an Infant Nine Months Old.* This is the only case of dysentery which our author had treated at the time he published his book, inasmuch as he had been unwilling to venture on the introduction of the tube in this disease. The result was favorable, and he expressed the opinion, warmly and emphatically, that the practice would prove successful, adding that he should seize the first opportunity to give it a more ample trial, and report the result, either favorable or unfavorable.

296. The infant in question, while teething, was seized with vomiting and purging, which were attributed to a two grain dose of calomel. Having been imprudently exposed by the nurse, she soon began to pass blood and mucus per anum, unmixed with fecal matter; she moaned continually, and threw up the breast milk nearly as soon as she took it. Local and general remedies seemed to be of no avail. Domestic injections were employed, but were invariably returned unchanged, and without producing any feculent discharge. She had passed no urine for twenty-four hours. At length, the family feared that she was dying, and sent for Dr. O'Beirne. He found her very pale, and seemingly unconscious of the persons about

her ; her feet and hands were very cold, notwithstanding they were wrapped in warm flannel. Every ten minutes she passed quantities of blood and mucus from the bowels, untinged with fecal matter ; and her abdomen was hard and distended. It was at once resolved to introduce the tube, and although it was but a size smaller than the stomach tube, no unusual difficulty was encountered in passing it, and the infant did not cry much, nor seem to feel much pain. As soon as the tube entered the sigmoid flexure, there was a burst of flatus, followed by fluid feces, blood, and mucus ; and on these ceasing to come away, an injection, composed of half a pint of warm water, and half an ounce (tablespoonful) of castor oil, was thrown up. The tube was then withdrawn, and was immediately followed by a considerable quantity of solid and fluid feces, mixed with blood, etc. In less than an hour, the infant became generally warm and very lively, took the breast with avidity, and without vomiting up the milk as before. A little weak chicken broth was now given to her, and every fourth hour, a teaspoonful of electuary of sulphur. During the day, she had two or three stools, from which blood and mucus gradually disappeared, and she slept naturally during the night. The following morning, she required no further treatment, and became a strong, healthy child.

297. Dr. O'Beirne contends that the introduction of the tube in cases of this kind, completely relieves the cœcum and colon, and thereby removes the cause by which fever, inflammation, and general suffering are kept up, and at the same time places the mucous membrane of the intestines in the most favorable condition for recovery.

298. It is suggested, also, that the introduction of the tube is likely to be still more beneficial in *chronic* than in *acute* dysentery, but whatever may be the form of the disease, Dr. O'Beirne advises that the tube be introduced whenever an increase of the symptoms indicates a fresh accumulation of fecal matter in the cœcum and colon.

DYSENTERY IN INDIA.

299. The confident prediction of Dr. O'Beirne, recorded in the last section, that the treatment which he proposed in dysentery would prove successful on further trials, has been amply verified by Dr. E. Hare, in India, who treated the disease in that country for five years with marked success, as we have already mentioned. He also made known the treatment to his medical brethren in India, whose testimony of its value is confirmatory of his own. See *Braithwaite*, No. 20, p. 88.

300. Dr. Hare coincides fully with Dr. O'Beirne, that the essential element of dysentery consists of the retention of fecal matter in the large intestines, which cannot make its escape, and he says, — "I have no doubt that the danger of dysentery is essentially caused by the long contact of feces and acrid secretions with the inflamed surface of the intestine, and if these be freely removed, the danger at once ceases."

301. Dr. Hare suggests that without first emptying the bowels of their contents, all efforts to subdue the inflammation in dysentery will be in vain. He illustrates this point by saying, that if the eye be inflamed, and a portion of dysenteric feces be placed within the lid and retained there, no treatment will

prevent ulceration of its coats. What, then, he inquires, is the first thing to be done in such a case? Why, of course, he answers, to wash away the offending matter, and then the inflammation will subside of itself, or with very moderate depletion.

302. Dr. Hare enforces his views by some apt quotations from the work of Dr. Annesley, who says, in speaking of the earlier stages of dysentery, that "collections of excrementitious matters tend very evidently to irritate and inflame the mucous surface on which they lodge, and cause ulceration and even sphacelation" (mortification) "in a very short period, if neglected, or injudiciously treated. In a great many cases, dysentery is preceded by costive bowels, often of long duration." * * * "Frequently the dysenteric symptoms are present from the first, the stools being scanty, and streaked with blood, with abdominal pain and tenesmus. In cases of this nature, the increased action of the muscular coats of the bowels, to which may be added the swollen state of the mucous membrane, especially about the sigmoid flexure and rectum, prevents the passage of the fecal collections through their canal, and in many cases occasions complete obstruction, little passing away but the perfectly fluid secretions."

303. The large experience of Dr. Annesley renders him unquestionable authority on this subject, and by consulting his plates or illustrations of dysentery, it will be seen that the colon is so loaded in some instances, that its horizontal portion is bent down by its own weight from the stomach to the region of the bladder. See plate III. p. 25, letter *N*.

304. In further confirmation of this point, a case is quoted from Dr. Annesley, in which purgatives at

first brought away large feculent stools ; but watery evacuations continuing, it was supposed that feculent matter was still lodged somewhere in the intestines, and that the watery evacuations were the effect of the irritation caused by its acrid qualities. Large doses of purgatives were therefore continued for several days, but no feces came away. The patient dying, a post mortem examination was made, and the small intestines were found loaded with feculent matter. It is to be inferred, therefore, that in the early stage of the case, the large and small intestines were equally loaded with feces.

305. The *treatment* of Dr. Hare, in acute dysentery, consisted of the introduction of an elastic tube above the sigmoid flexure, as recommended by Dr. O'Beirne, and injecting four or six pints of warm water.* Thus, he says, the intestine may be thoroughly washed out from cœcum to anus. The water, he adds, mixes intimately with the feces, and "cannot return without fecal matter with it. It is astonishing how readily a hard mass of feces will soften and break down in water. Any one may prove this for himself without much trouble. The tube, too, can be moved up and down, and the water made to work its way at all points of the descending colon. By the first injection, some fecal matter, at least, will be softened and removed, and the injection can be applied again and again, till the relieved intestine eject itself the harder matters, reduced, as they must be, in size, if any remain."

306. "A gentle mulling† of the abdomen with the

* Some remarks upon the use of the rectum tube in dysentery, by Dr. Hare, will be found in paragraph 281.

† *Kneading* would perhaps be a better word.

hand," Dr. Hare says, "while the injection is still in the bowels, assists it greatly in bringing away the accumulations. I generally keep the patient on his back, occasionally turning him to his left side. When he complains of, and I see that there is, distension of the abdomen, I cease to inject, and commence, if he can bear it, a gentle mulling. The patient then sits up, and the injection never fails to carry all away with it."

307. The astringent injections which Dr. Hare found to be the most useful, were first, a mixture of catechu and milk; and second a solution of nitrate of silver, formed by dissolving fifteen grains of the nitrate, in two and a half or three pints of water. He speaks of the impropriety of using the ordinary astringent injections without previously and thoroughly evacuating the large intestines, in the way he has pointed out.*

308. Dr. Hare concludes his essay by saying,—
"I would strongly urge those who may in future try this system, not to mix the old treatment with it, and dose their patients with calomel and purgatives which are directly opposed to it, and not to be led away by false theories of hydropathy, and absorption of water, which are utterly without the shadow of probability, and to give injections without limit in quantity within the patient's endurance. You cannot injure a piece of dead intestine by distending it with water, much less the living, which quickly contracts powerfully on its contents; and do not cease repeating the injection, till you are satisfied that the colon is evacuated and cleansed."

* This, as a general thing, can undoubtedly be accomplished with injections of water, without the use of the rectum tube.

309. Though Dr Hare seems to be opposed to the use of mercury internally, he thinks it may be used as an ointment, and says, "free venesection" (bloodletting) "will often be required in acute, and leeches in chronic dysentery." He remarks, also, that if injections are useful in the acute form of the disease, they are still more so in the chronic form.

DIARRHŒA AND CONSTIPATION.

310. Cases of diarrhœa occur now and then, as is well known, in which the discharges are inconsiderable, while the tenesmus or straining is very severe, and the ordinary treatment of diarrhœa does not afford the expected relief. The credit of having first described this form of disease accurately, has been awarded by Dr. O'Beirne to Dr. John Warren, of England, and since that time, which is now perhaps nearly forty years, the description has been scattered through so many medical books and journals, without any credit, that it is quite refreshing to come back for a moment to the original. Dr. Warren says,— "The malady assumes the appearance of a diarrhœa, but is, in fact, a constipation, or at least, owes its origin to an unusual collection of indurated feces in the rectum. That it may in future be more easily distinguished from diarrhœa, which is so opposite to it in its nature, and with which it is so apt to be confounded, it may not be improper to remark, that in all cases which I have seen of this disorder, the pain is principally seated in the lower part of the abdomen, and is always accompanied with a tenesmus, or a sense of bearing down, which is never attendant on a simple diarrhœa; that the motions are at all times incon-

siderable, and in general, mixed with scybala; and that it is a disease which does not yield to any remedy administered under the supposition of its being only a purging. It is likewise worthy of notice, that the pains attending it are infinitely more acute than any ever experienced in a diarrhœa. I must also add, that it is a disease peculiar to persons in advanced life, (pregnant women excepted,) as I have never met with an instance of it in patients under sixty."

311. The *cure* is to be effected by dislodging the fecal matter from the rectum with a surgical scoop, or otherwise, if necessary, and using injections until the bowel is entirely freed. The local employment of astringents, also, in the form of ointment, or solution, will prove beneficial. Two ounces of a solution of tannin, injected at bedtime, and retained, will prove serviceable. Form. 15 p. 86.

COLD WATER INJECTIONS.

312. Since the advent of Priessnitz, the Silesian peasant, who originated the hydropathic or water cure treatment, injections of cold water have been extensively used in a variety of diseases; and in many cases they appear to answer an admirable purpose. Their use, however, is not merely sanctioned by Priessnitz and his followers, for they were advocated a long time ago by the famous Broussais and his disciples, who, from some peculiar notions that fever had its origin in an inflammation of the mucous membrane of the stomach and bowels, frequently ordered the injection of cold water into the rectum. It is not to be denied, however, that we are principally indebted to Priessnitz for the systematic intro-

duction of cold water, in its various forms, as a remedy in disease; and without further remarks upon this subject, we will briefly present to the reader some practical hints and directions for the employment of cold water in the form of injections.

313. *Temperature, etc.* In commencing the use of cold water injections, special attention should be given to the temperature, for if the water be too cold, it will produce a very unpleasant sensation in the rectum. The author of the Water Cure Manual, who visited Priessnitz at his establishment in Germany, to obtain a more accurate knowledge of his theory and practice, very correctly advises, that in case of much debility, either in the young or old, the water should be of a moderate temperature, not exceeding that of the blood, nor much below that point. Even when there is much inflammation and heat in the bowels, he says that injections of water at ninety or ninety-five degrees, if persevered in, will readily bring down the temperature of the parts to the natural standard, as may be ascertained by placing the hand upon the abdomen. The patient's feelings of comfort as to warmth or cold, are considered a good guide, and by prudently regulating the temperature in this way, the injections may be repeated almost without limitation. When there is no special debility present, colder injections may be used, commencing, however, with a temperature of about 72 degrees. See pages 73, 74, 75.

314. The *quantity* of cold water necessary to evacuate the bowels in constipation, varies in different individuals. In some cases, three quarters of a pint is sufficient, and in others, double, treble, or quadruple that quantity is required. The only rule

which need be given, is, to inject a sufficient quantity to produce the desired result.

315. *Bowel Complaints.* Cold water injections are considered of great value in the various bowel complaints, as diarrhœa, dysentery, cholera morbus, and cholera infantum. Dr. Rausse, of Mechlenburgh, Germany, says that in dysentery, "a great many water clysters should be given, as they come directly to the inflamed parts of the bowels, where the proper seat of the disease lies. The water cools the inflammation and dilutes the acrid and morbid matters which are poured into the intestines." The author of the Manual already quoted, says that in cholera infantum, when the infant is already past recovery, he has known injections of tepid water, frequently repeated, to afford the little sufferer much temporary relief.

316. We have long used injections of water in bowel complaints, and can vouch for their efficacy. They have the advantage of not interfering with any mode of treatment which the physician may adopt, and if the temperature be properly regulated, they are not likely to do injury. If the patient is chilly or exhausted we employ them milk warm ; but if hot and feverish, we prefer colder injections, adapting the temperature, however, as a general thing, to his feelings.

317. *Indigestion and Constipation.* Dr. Rausse, quoted above, in some remarks upon the use of cold water injections in these complaints, observes, — "With persons already sunk deep in the miseries of impaired digestion and constipation, the injections are at first discharged before they become warm in the bowels, and without being followed by much excrementitious matter. One must not allow this to lead

him astray, but continue the injections, for soon the water will be retained, and whole injections will be absorbed, — a proof of the need the bowels have for the healing element. Finally, healthful evacuations ensue, and after a length of time, perhaps several months, begins the liberation and evacuation of the old indurated matters of the bowels, which have become like hard bullets.”

318. Dr. Kuster, of Germany, speaking of the removal of indurated feces or scybala, says, — “We need very large injections for this purpose, and even these do not always answer the purpose. We may be certain of succeeding, if we first inject two ounces of warm oil. If this does not operate in the course of an hour, repeat the injection, with four or six ounces of soap suds. If even this should fail, success may be confidently expected, after a few hours, from an injection of six or eight ounces of lukewarm water, mixed with a little salt.* I consider it more proper to use these injections, than to repeat the water injections by the dozen per day.

319. “It may be an object,” adds Dr. Kuster, “to produce a contrary effect, namely, to stop diarrhœa. This we attain with more certainty by injections of starch.” (See Form. 5.) “After succeeding in this way, we may pass by degrees to injections of six or eight ounces of lukewarm or tempered water.”

320. *Piles*. The injection of cold water is becoming a very popular remedy in piles or hemorrhoids, and is at least a very useful palliative, in connection with other treatment. It produces an evacuation of the bowels unaccompanied by the usual pain

* A tablespoonful of salt is the usual quantity.

or irritation, which is a very great matter; the cold water also relieves the heat and inflammation of the rectum, and thereby greatly diminishes the severity of the disease. It is recommended to inject a gill or two of cold water at bedtime, so that it may be retained; this, it is said, is very soothing to the nervous system, aids in procuring refreshing sleep, tends to invigorate the rectum and adjacent organs, and assists materially in reëstablishing the natural movements of the bowels. Persons wishing to get rid of the piles, however, must attend to their general health, and not rely too exclusively upon local treatment — avoiding improper articles of diet — eating less, if they are gluttonous — taxing their brains less, if they are students or professional men — and, in short, getting rid of those weakening and enervating influences which inevitably wear out and destroy the body.

321. Dr. Wesselhœft, of the Brattleboro' Water Cure, in some remarks upon the treatment of piles, published six or seven years ago, says, — "Injections of cold water, from seventy-two degrees of temperature down to the coldest, according to circumstances, and particularly when costiveness prevails, should be freely used. I have treated cases of internal piles, with long lasting obstruction of the bowels, by four or five injections a day of one and a half pints each. They were not only borne well, and mostly absorbed by the bowels, but they also made the patients feel comfortable in the head, and finally, produced a natural operation, which was followed by an uninterrupted regularity in this respect during the whole cure, and afterwards. There is no danger in accustoming the rectum, etc., to these applications, for as it becomes stronger, and is cured by them, the

injections may be given at any time, or omitted as soon as they have produced the desired effect. Their temperature is more to be regarded than any thing else."

322. With regard to the adaptation of cold water injections to particular cases, Dr. Teissier, of Lyons, expresses the opinion that they are better suited to individuals of a nervous, highly irritable temperament; to the hypochondriacal; and to females suffering from irritation or engorgement of the womb.

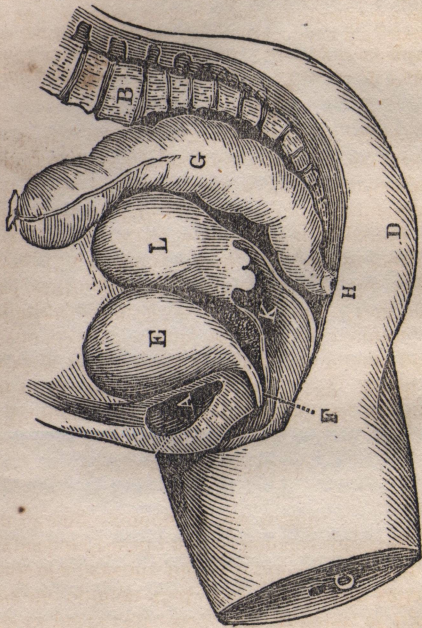
VAGINAL INJECTIONS.

323. To make this subject intelligible, we invite attention to the illustration on page 139, which furnishes a view of the organs within the female pelvis, namely, the bladder, womb, vagina, and rectum. The plate represents a division of the pelvis from before backward, cutting through the middle of the vagina, but leaving the bladder, womb, and rectum entire.

324. The illustration will make it apparent how *prolapsus uteri* or *falling of the womb* produces bearing down pains, and interferes with the discharges of the urine and feces by pressure upon the urethra and rectum. It will also explain the nature of *retroversion*

Explanation of Plate IV. See opposite page. — A. Pubis or front bone at the point of division, called by anatomists the symphysis pubis. (For the bony structure of the pelvis, see plate I. p. 15.) *B.* Spine or back bone cut through the centre. *C.* Portion of the right thigh. *D.* One of the nates or right buttock. *E.* Bladder, somewhat distended, rising behind the pubis. *F.* Urethra or canal leading from the bladder. *G.* Rectum. *H.* Anus. *K.* Vagina. *L.* Womb or Uterus, with its neck and mouth protruding into the vagina.

PLATE IV.



ORGANS WITHIN THE FEMALE PELVIS.
For explanation of the Plate, see opposite page.

of the womb, in which its top or fundus is thrown back upon the rectum, and its mouth forward upon the urethra, or bladder, interfering with the evacuation of the bowels, and giving rise to great distension of the bladder. This accident, it may be remarked, usually happens about the third month of pregnancy, or after childbirth, before the womb has had time to return to its natural size. Hence the importance, after delivery, of remaining a week or more in the horizontal position.

325. *Vagina*. This is the canal or passage leading to the womb, as shown in the plate. In the adult female it is five or six inches long, and terminated at its upper extremity by the womb, the neck of which it encircles. The lower portion of it is connected with the rectum behind, and the bladder and urethra in front.

326. *Womb* or *Uterus*. This organ, as already indicated, is situated at the top of the vagina, between the bladder and rectum. The upper part is called the *fundus*; the middle portion, the *body*; and the lower part, the *cervix* or *neck*. The inferior portion of the cervix is divided into two lips by a transverse slit, and is variously called *os internum*, *os tincae*, and *os uteri*, signifying *mouth of the womb*. Between these lips is the orifice leading into the cavity of the womb. The length of the organ is about three inches. Its width at the neck is one inch, and at the fundus or top two inches. Its cavity is so small as scarcely to admit a bean or an almond. The length of the neck varies from half an inch to two inches. The womb is plentifully supplied with nerves, and hence, the intimate sympathy which exists between it and the stomach, breasts, and other parts of the body,

when it is in a morbid or diseased condition. Small as are its dimensions in the natural state, it increases to a wonderful size during pregnancy, measuring twelve inches or more in length, at the full term, and nine inches in width at the fundus. Its weight, too, which at puberty is only *an ounce and a half*, is estimated at from *two to four pounds*, during the latter period of pregnancy. Its cavity, which was only large enough to hold an almond, now contains the child, invested by its membranes — forming of themselves a large mass — and two or three quarts of fluid termed the *waters* or *liquor amnii*.

327. VAGINAL DISCHARGES. As it is in reference to these that vaginal injections are usually employed, we deem it proper to say a word or two of their character and appearance. The term leucorrhœa is applied to these discharges, whatever may be their color, though, strictly interpreted, leucorrhœa signifies a “white flow.” It is synonymous therefore with *fluor albus*, which also signifies a white discharge, and which has given origin to the familiar, every-day term of *whites*.

328. The vagina and interior of the womb are lined with what is called a mucous membrane, which, in health, is the seat of a transparent secretion termed *mucus*, resembling the white of an egg, and intended to soften or lubricate the surfaces with which it is in contact. This secretion is naturally small in quantity, but it may become excessive from inflammatory action, or constitutional and local debility, and thereby constitute leucorrhœa.

329. There is no disease peculiar to women which is more common than leucorrhœa, in some form or other. It is the most frequent among married women

who have borne children, but it also attacks the unmarried, and is met with not unfrequently in young girls. Even infants suffer occasionally in this way, and require the interference of the physician. We recently prescribed for a little girl only four years old, with a very abundant and troublesome leucorrhœa, for which there was no assignable cause, excepting a somewhat scrofulous condition of her system.

330. Women frequently report themselves as having suffered for years, or perhaps a lifetime, with leucorrhœa, and yet not complaining much in the meantime of ill health. Others again decline very rapidly in health, become more or less emaciated, and suffer with dyspepsia, loss of appetite, constipation, debility, nervousness, and so on to the end of a long chapter.

331. Dr. Burne mentions it as a curious fact, that a *pain in the left side, about the margin of the false ribs*, is almost a sure indication of the existence of either leucorrhœa, irritable womb, falling of the womb, or of pregnancy.

332. Climate not unfrequently exercises an undoubted influence in the production of leucorrhœa. An American gentleman from Siam, where he had resided for ten years, consulted us recently on account of a leucorrhœal difficulty of his wife, which she had contracted in that country; and he informed us that although the native women of Siam and other parts of India, were not troubled in this way, yet foreign ladies from the temperate climates, almost without an exception, after residing in India about a year, would begin to complain of leucorrhœal difficulties. The young and unmarried women were by

no means an exception to the rule. There was no treatment which seemed adequate to the cure of the disease, and it frequently happened that the wives of the missionaries, and of the officers of the English regiments quartered in India, were obliged to return home on account of the exhausting effects of the malady. The temperature in some parts of Siam rarely exceeds sixty or seventy degrees of Fahrenheit, so that the malady is more attributable to some peculiar influence of climate, than to excessive or long continued heat. Temperature, nevertheless, has much to do with leucorrhœal complaints, for every woman who is afflicted in this way, will bear testimony that she suffers much more in summer than in winter.

333. Vaginal discharges vary in consistence and color according to the condition of the membranes or tissues by which they are secreted. They may be thin or watery, or thick and glutinous; they may be bland and unirritating, or so acrid as to excoriate and inflame; they may be white, yellow, green, brown, or red, the latter color depending upon the presence of blood; they may be without odor, or they may be very strong and offensive.

334. *Watery discharges* depend in some cases upon what are termed *hydatids* of the womb, which are little cysts or bladders, containing a watery fluid. The discharge is not continuous, but takes place suddenly at longer or shorter intervals, and is caused by the rupture of one or more of these bladders by the contractions of the womb.

335. Watery discharges are also due to a disease termed *cauliflower excrescence*, situated upon the neck

of the womb,* which is a sort of granulated tumor, covered by a thin membrane or pellicle, which constitutes a secreting surface, and from which the water dribbles away in a larger or smaller quantity. Sometimes blood is mingled with it, in consequence of a rupture of the pellicle.

336. *Mucous discharges*, better known to women as the *fluor albus* or *whites*, result from local irritation or inflammation. In falling of the womb, there is apt to be a copious mucous discharge.

337. *Bloody discharges* are not uncommon, and may arise from an abrasion or rupture of some of the minute vessels; or a threatened miscarriage; or polypus, or other tumor of the womb; or hydatids, or cauliflower excrescence, as already mentioned; or the ulcerative stage of cancer of the womb.

338. Bloody discharges not unfrequently consist of the menstrual fluid,† which makes its appearance at too early a period, or continues to flow irregularly after the time for its cessation. This fluid, it may be remarked, differs from pure blood in not coagulating or forming clots. It should be remembered, however, that the blood may become so impoverished by long continued flowing as to lose the power of coagulating.

339. Purulent or pus-like discharges are the result of severe inflammatory action in the vagina, or womb, and are usually of a yellow color, but may assume a

* The neck of the womb being glandular, we look here for malignant and other diseases peculiar to glandular structures.

† *Menstruation* is the discharge of a fluid from the womb resembling blood, which, in every healthy woman who is not pregnant, or who does not suckle, takes place monthly, commencing at puberty, and continuing till the age of forty or fifty. The discharge is termed *catamenia* and *menses*.

greenish or brownish tint, indicating an increasing severity of the disease.

340. Vaginal discharges, so termed, may not arise from the vagina itself, but from the interior of the womb, and in difficult or obstinate cases, it is important that the physician should distinguish the true seat of the disorder. The symptoms themselves, however, apart from a proper examination, will throw some light upon the subject. If the vagina only is involved, there is generally but little if any disturbance of the general system, but if the womb be implicated, the health is more or less affected, as might be expected from the intimate sympathetic relation existing between this and other organs of the body; and hence, we find the patient complaining of headache, nausea, and perhaps vomiting, with more or less derangement of the stomach, liver, and bowels, and pains also in the lower part of the abdomen. If the discharge is observed for the first time after abortion or childbirth, there is reason to suspect that it may proceed from the womb.

341. A copious and long continued leucorrhœa should not be too suddenly arrested without a previous restoration of the general health, as there is danger, without this precaution, of producing other forms of disease of a more serious character.

342. USE OF VAGINAL INJECTIONS. In using vaginal injections, the womb is not also injected at the same time, because the mouth of it is closed, and will not admit of the passage of the fluid. We are induced to make this remark, because there are syringes in the market, with long, slender, crooked pipes, which, singularly enough, are labelled "*womb* syringes," and there are women now and then who use

these instruments with the assured conviction, strange as it may appear, that they actually inject the womb. We may add, that the only convenient method of injecting this organ is to introduce a small appropriate tube into its interior, and couple it with a suitable syringe. This operation is performed occasionally by physicians in the treatment of "female complaints," and in some cases of obstinate disease of the uterine cavity, it would seem to be indispensable to the cure.

343. Vaginal injections are used for two distinct purposes; *first*, without much regard to quantity for the purpose of removing or washing away the acrid or vitiated secretions which have collected in the vaginal canal; and *second*, in the quantity of about a gill, with a view to the retention of the fluid for ten or fifteen minutes, so that it may make a more thorough impression upon the vagina and external portion of the neck of the womb, with which it comes in contact. Copious injections of tepid or cold water are also employed occasionally for purposes which will be alluded to presently

344. *Position, etc.* If the injection is to be used without an assistant, and is intended to remove the secretions from the vagina, the best position is a partially kneeling one, supporting the body on the right or left foot and the opposite knee, and resting the back at the same time against the wall or partition. The vessel employed to receive the injected fluid, after it has performed its office, may also aid in supporting the body, if necessary.

345. The vaginal tube is to be employed for the injection of the fluid. If either the vagina or neck of the womb is in a painful or irritable state, the

fluid should be injected with a moderate force, and when the parts become more healthy, or more accustomed to the application, the injecting force may be increased to any degree that may seem desirable.

346. If the leucorrhœa is abundant, the injection should be repeated two or three times a day, using each time, one or two pints of fluid; for if acrid secretions are permitted to remain in the vagina, they will increase the existing irritation, and tend to prolong or exasperate the disease. The fluid employed for this purpose may consist of a solution of Castile soap, (soap-suds,) or of pure water, either tepid or cold.

347. *Temperature, etc.* We have said either *tepid* or *cold water*, because we know of no rule, respecting temperature, that will apply to all cases. Cold injections are not borne by some, while the warm ones are soothing, grateful, and even curative. Dr. Ashwell, in his excellent work on Diseases of Females, quotes Dr. Gooch as saying, — “Practitioners have exhausted all the cold astringent remedies, and then, having recourse to tepid ones, the patient has been cured immediately.” The reverse of this is also true; and now and then we have the assurance of ladies, that “nothing has done them so much good as cold injections.” The temperature which is most agreeable at the time the injection is used, or which produces the most agreeable effects for half an hour or an hour afterwards, may be usually regarded as the best adapted to the case. As a general rule, it is better, in almost every case, to begin with warm injections, and gradually to diminish their temperature, if it be found that the colder ones are well borne, and prove beneficial.

348. *Further uses of the Injections.* During pregnancy, the cold water injections have been found of great value in the most of cases, commencing however with tepid water, as already suggested. A pint or more may be thrown into the vagina once daily, or two or three times a day, if the repetition should prove agreeable and beneficial.

349. In *prolapsus uteri* or *falling of the womb*,* a vaginal douche consisting of one or two pints of cold water, and repeated two or three times a day, is frequently of much service in giving tone to the debilitated parts. The water may be injected with considerable force and thrown upon the prolapsed organ, as well as in every other direction within the canal.

350. If the *menses* are tardy in making their appearance, a pint or two of warm water injected several times a day, is frequently useful in restoring the function; but if, on the other hand, the flow is too long continued, cold injections usually answer a better purpose. In this form of the malady, however, in which pure blood has taken the place of the menstrual secretion, the injections of cold water, (see

* Women are often presumed to have falling of the womb, when there is no sign of the malady. We remember to have prescribed for a lady who had been tortured for more than a year by all sorts of pessaries, upon the supposition that she had falling of the womb. The pessaries had produced a high degree of irritation, and gave rise to a copious, acid, and troublesome leucorrhœa, of which she was anxious to be relieved. The neck of the womb happened to be situated unusually low down in the vagina, but without presenting the slightest evidence of any unnatural descent of the organ, and on this account, the poor lady was recommended to wear pessaries until her health was nearly destroyed by the leucorrhœa which they occasioned.

par. 351,) will answer a better purpose if thrown into the bowels. Dr. Ashwell, speaking of these cases, in which there is a continual drain of blood from the womb, with a pale countenance, weak pulse, coldness of the extremities, and excessive nervousness, says that they are almost invariably benefited, and sometimes cured, by the injection of three or four ounces of tepid, or (after a time) cold water, into the rectum, night and morning.

351. Instead of the small quantity of water here recommended, we would advise the injection of at least a pint, using it as cold as can be borne, and retaining it as long as possible.

352. In enlargement of the neck of the womb, which is very apt to be the seat of engorgement, as well as of ulceration, and other forms of disease, (see note, p. 145,) injections per vaginam of cold or warm water two or three times a day, are frequently useful in reducing the enlargement. Mrs. Davis, the well known lecturer on physiology, who has had much to do with the diseases peculiar to her sex, informs us that she usually prefers tepid water injections in these cases, and that she directs them to be used three times a day, in the quantity of a pint or more, continuing them, if necessary, for two or three months. She has found this mode of treatment highly beneficial.

353. *Retention of the Injection, etc.* If the injection is to be retained, the quantity of fluid should be sufficient to fill the vagina, which will vary from two to four ounces. The best position for this purpose, is a reclining one upon a sofa, or bed, with the hips somewhat elevated; this position is indispensable when the neck of the womb is the seat of the dis-

ease, for then the fluid will find its way to every portion of the diseased surface. (See plate IV. p. 139.) The escape of the fluid is to be prevented by pressing the external parts closely together around the tube, or by using a napkin for this purpose. The injection should be retained for ten or fifteen minutes, so that it may make the requisite local impression. By placing the syringe in a convenient position, there will be no trouble in using the injection in a reclining posture. When a medicinal injection is to be retained, the vagina should be previously washed out with warm or cold water.

354. When an *astringent injection* is needed, it may consist of a decoction of white oak bark, or a solution of tannin. (See formulas 14 and 15, p. 86.) This is used as a remedy in leucorrhœa, either warm or cold, and should be retained for ten or fifteen minutes. The whitish or ash-colored flakes which are sometimes observed in using this injection, are formed by the action of the astringent upon the albuminous secretion with which it comes in contact.

355. Astringent injections are not always adapted to leucorrhœa accompanied by acute inflammation. In this case, soothing or emollient injections, such as a thin mucilage of elm, starch, or flaxseed, (formulas 4, 5, 6, pp. 82, 83,) or even tepid water, will answer an excellent purpose, and may be repeated several times daily, using the precaution to prevent its immediate return.

356. When medicinal or other injections are employed as a remedy in leucorrhœa, it is usual to suspend them during the menstrual period, and to employ tepid water injections in their place.

357. In *conclusion*, we would say to the fair reader,

that though the injections here recommended are valuable as palliatives, in all cases of leucorrhœa, yet it is only in the milder cases that they are curative; and if the disease should prove obstinate, and more particularly if it should involve the *interior of the womb*, we would advise her, without delay, to solicit the advice of her medical attendant, and eschew the thousand and one quackeries of the day. There are no diseases which require to be so accurately studied as those of the uterine system, and if they cannot be successfully treated by our skilful and experienced physicians, I know not what we are to expect from the unskilful and illiterate empiric. Besides, there have been many improvements introduced of late years, into the treatment of uterine diseases, and this, of itself, would seem to entitle our educated physicians to some portion of that confidence which is so unhesitatingly bestowed upon the merest pretenders in medicine.

INDEX.

The Numbers refer to paragraphs unless preceded by the word page.

A.

Abbreviations, 147 ; page viii.

Abdomen, 9, 10

“ contents of, 11

Abdominal regions, 2, 13

“ “ plate of, page 19

“ cavity, 2

Acetabulum, 5

Acid of Stomach and Intestines, 58

“ “ in children, 57

“ causes dysentery, etc., 58

“ is absorbed, 58

Acidity of Stomach cured by hot water, 162

“ and of urine, 58

Albumen in dysenteric discharges, 79

Alimentary canal, 33

Aloes and Soap, injection of, 198

Anodyne injection, 211

“ “ for an infant, 215

Anus, 49

Antispasmodic injections, 218, 227, 228, 230, 233

Appendix vermiformis, 45

“ cœci, 45

Aromatic herbs, injections of, page 83

Astringent injections, page 86

Bile, described, 62

“ a stimulant of bowels, 62

“ should not enter stomach, 63

Bladder, E, plate IV. page 139

Blood passed at stool in piles, etc. 73

Borborygmus or flatulence, 114

The Numbers refer to paragraphs unless preceded by the word page.

- Bowel complaints of children, see Diarrhœa.
- Bowels fetid, or flatulent, turpentine injection, 237
- “ ulceration of, nitrate of silver injections, 259
- Britannia, how to cleanse, 180

C.

- Carbonic acid enters lungs from stomach, death, 125
- Cathartic powder, injection of, 200
- “ formula for, note, page 85
- Castor oil and turpentine, injection of, 199
- Catamenia, see Menstruation, note, page 145
- Cauliflower excrescence, 335
- Chest or thorax, 9
- Child-birth difficult from deformed pelvis, 8
- Children, soothing injection for, 210
- Cholera, injection for, 251
- Cholera morbus, cold water injection in, 315
- “ infantum “ “ 315
- Chyle, formed from chyme, 62
- “ described, 67
- Chyme, 62
- Clay-colored stools, 73
- Clysters, see Injections.
- Cod liver oil, when to take, 65
- Cold water injections, page 133
- Cœcum, situation of, 31
- “ described, 45
- Colic, forms of, described, note, page 99
- “ turpentine injection in, 237
- “ painter's, case treated, page 99
- “ injection of goose oil and snuff in, 239, 240
- “ O'Beirne's views of, treatment, 291
- “ cured by warm water injections, etc., note, page 124
- Colon, situation of, 31
- “ described, 46
- “ its relation to other organs, 54
- Constipation and diarrhœa, 310
- “ of six months' standing, 71, 285
- “ constricted state of rectum, cause of, 108
- “ laxatives, how used in, note, page 52

The Numbers refer to paragraphs unless preceded by the word page.

- Constipation, how cured in some cases, note, page 52
 " increased by flatulency, 114
 " cold or warm water injections in, 142
 " injection in, of castor oil and turpentine, 199
 " " senna, jalap, and cloves, 200
 " " Lobelia inflata infusion, 227
 " " ox gall, 242, 243, 244
 " stimulant injection in, 232
 " large injections in, 264, 266
 Croup, injections for, 225, 226, 234

D

- Decoction, described, 150
 Defecation, New Views of, 90
 Diaphragm. situation of, etc., 16
 Diarrhœa, when to use opium in, note, page 39
 " elm injection in, 190
 " starch " 192
 " of children, injection of raspberry leaves, 196
 " " " of logwood, 202
 " injection of white oak bark, 203
 " " tannin in solution, 204
 " anodyne injections in, 216
 " cold water injections in, 315, 316
 " and constipation, 310 ; treatment, 311
 Digestion, 60
 " agents of, 60
 " motions of food in stomach during, 66
 Dislocations, reduction of, 223
 Drunkenness, injection for, 249
 Duodenum, 40
 " its relation to other organs, 52
 Dysentery in India, treatment of Dr. Hare, 281, 299, 305, 306 ;
 essential element of, 300 ; first step in the treatment,
 301 ; remarks on by Dr. O'Beirne, 294 ; case treated
 by, 295 ; view of Dr. Annesley, 302, 303, 304 ; in-
 testines loaded with fecal matter. 303, 304 ; purga-
 tives do not remove the fecal accumulations, 304 ;
 forms of astringent injections the most useful, 307 ;
 elm infusion by stomach, note, page 82
 Injection of elm in, 190 ; of starch, 192 ; of logwood, 202 ;

The Numbers refer to paragraphs unless preceded by the word page.

Dysentery, *continued*.

Injection of tannin, 204 ; soothing injection, 209 ; anodyne injection, 216 ; oleaginous injection, 238 ; injections of nitrate of silver, 253, 254, 257 ; injections of cold water, 315.

E.

Elm infusion in dysentery, note, page 82

“ injection, “ 188

Emphysema of lungs, 110

“ explained, note, page 55

Enema, see Injection

Ensiform cartilage, 15

Epigastrium or epigastric region, 23

F.

Falling of the bowel, 206

“ womb, explanation 324.

Feces or excrementitious matters of bowels, 70 ; important to inspect them, 70, and note, page 39 ; average quantity of, 71 ; peculiarities of, 72 ; color of, 73 ; with blood, 73 ; dark or black from purgatives, 74 ; colored by medicines, 76 ; very fetid, 77 ; form of in some diseases, 78 ; vary according to the disease, 79 ; where do they accumulate ? 90 ; rectum not a reservoir of the, 91, 92 ; process by which they are evacuated, 103, 105, 106 ; conclusions respecting, 107 ; feces and urine not passed at same time, 104

Feculent matter in small intestines, 69

Female injections, see Vaginal Injections.

Fermentation, putrefactive, 118, 119

“ and putrefaction, 124

Fevers, injection for, 201

“ and inflammations, 221, 222, 228, 297

Flatulence, page 54

“ different forms of, 114

“ of abdomen may suddenly disappear, 128

“ turpentine injection in, 237

“ cured by draughts of hot water, 162

Flatus or wind, 109

Flax seed injection, 194

The Numbers refer to paragraphs unless preceded by the word page.

- Flooding after child-birth, injections, 224, 235 ; cold water injection per rectum, 350, 351
 Fluor Albus, see Vaginal Discharges, 327, 336
 Food, non-nitrogenous, and nitrogenous, 118
 Formulas for injections, page 80
 Fundament or anus, 49

G.

- Gall-bladder, plate of, page 25 ; explanation of, note, page 24.
 Gases of stomach, intestines, etc., page 54 ; office they perform, 109, 120 ; when to be considered morbid, 109 ; may arrest breathing, 113 ; cause pain in remote parts, 115 ; in womb, bladder, chest, 110, 111 ; composition and source of, 116—120 ; are they secreted? 121—128 ; they permeate animal membranes, 121—128 ; experiment with a bladder, 122, 123 ; curious case of poisoning with, 125
 Gas in stomach, 112
 " cœcum and colon, 113
 Gaseous accumulations may disappear suddenly, 128
 Gastric juice, 61
 Graduated measure, 149
 Gout, retrocedent, case, 283
 Groin, line of, 19

H.

- Headache, cured by draughts of hot water, 178 ; by injections, 186
 Hernia, strangulated, mode of relaxing system in, 223
 Hemorrhoids, see Piles.
 Hunger appeased by a nutritive injection, 250
 Hydatids of womb, 334
 Hypochondriac regions, 24
 Hypogastric region, 27
 Hysteria, antispasmodic injections, 218, 219, 228 ; injection of pennyroyal, 195 ; case treated by Dr. O'Beirne, 293

I.

- Ileo cœcal valve, 42 ; passed by an injected fluid, 263, 269, 270

The Numbers refer to paragraphs unless preceded by the word page.

Iliac passion, 50

“ regions, 28

Ilium, 42

Injecting Instruments, see Syringes.

Indigestion and constipation, injections in, 317

Infant, anodyne injection for, 215

Inflammation, injection for, 201, 221, 222

“ of brain, 221, 222

“ intestines, case treated by Dr. O’Beirne, 290

Infusion and Decoction, 150

Inguinal region, 28

Injections, use and value of, 129 ; employed for various purposes, 130 ; impress general system, 131 ; action of on rectum, 131 ; useful in retained placenta or after-birth, 131 ; in constipation, 132 ; in suspended animation, 133 ; sustain life when there is inability to swallow, 133 ; substitute for cathartics, 137, 138, 141, 143 ; value of not appreciated, 140

Opinions of authors respecting, page 65 ; Prof. Dewees, 136 ; Dr. Warren, of Boston, 138 ; Dr. H. H. Smith, 139 ; Prof. Mitchell, 140 ; Dr. Baille, of London, 143

Quantity of fluid for, page 71 ; warm, cold, or stimulant, 155 ; fact respecting quantity, 155 ; opiate or anodyne, 157 ; bland or soothing, 158 ; purgative, 159 ; rules for repetition of, 152, 153

Temperature of, page 73 ; warm, efficacy of, 160 ; cold, when to use, 163 ; cold or warm, choice, 142 ; begin with temperature of 72 degrees, 163 ; in debility, use warm injections, 165

Directions for taking, page 75 ; position, 166 ; of patient in bed, 167 ; of infant, 168 ; introduction of tube, 169, 170 ; injection of the fluid, 171, 172, 173 ; rectum impacted, how to proceed, 175

Formulas for, 182

Common or simple, page 80 ; warm water, gruel, etc., 183 ; remarks on by Prout, 186 ; soap and water, 185 ; oatmeal, 187

Mucilaginous, page 82 ; elm, 188 ; starch, 192 ; flaxseed, 194

Of aromatic herbs, page 83 ; pennyroyal, catnip, spearment, 195 ; wild red raspberry, 196

The Numbers refer to paragraphs unless preceded by the word page.

Injections, continued.

Laxative, 197

Purgative, page 84; aloes and soap, 198; castor oil and turpentine, 199; senna, jalap, and cloves, 200; cathartic powder, note, page 85

Astringent, page 86; logwood, 202; white oak bark, 203; tannin, 204

Soothing, 208, 210, 188, 192

Opiate or anodyne, 211; for infant, 215

Antispasmodic, 218, 219, 220; stimulant injection, 230, 236; lobelia injection, 251, 252

Lobelia inflata, page 91; formula for, 227; infant, 229

Stimulant, 230, 236; valuable antispasmodic, 233

Turpentine, 237

Oleaginous, page 98; mutton suet and milk, 238; goose oil and snuff, 239, 240

Ox gall, 241

For worms, 245; wormwood, aloes, etc., 246; bayberry, 247

Yeast, 248

For Drunkenness, 249

Nutritive, 250

For Cholera, 251

Nitrate of silver, 252; use of, by Dr. Hare, 253; in dysentery, 254, 255; in typhoid fever, 256; how to use, 258; in scrofulous ulceration of bowels, 259; discoloration by, 260; opinions of Dr. Horace Green, 261, 262

Large, page 110; cases cured by, 264, 266; best form of, 271; given with rectum tube, page 114; gallon of fluid injected, case, 290

Cold Water, page 133; used by Priessnitz and Broussais, 312; temperature of, 313, 316; quantity of, to evacuate bowels, 314; in bowel complaints, 315, 316; relieve "excitement and spasm" of sigmoid flexure, note, page 53; in piles or hemorrhoids, 138, 320, 321; in indigestion and constipation, 317, 318; by Doctor Rausse, 317; by Dr. Kuster, 318; adaptation of, to particular cases, 322

Vaginal, page 138; reference to plate, 139; use of, etc., 342; womb not injected at same time, 342; employed

The Numbers refer to paragraphs unless preceded by the word page.

Injections, continued.

for two purposes, 343; position, etc., 344; tube, etc., 345; how often repeated, 346; temperature of, 347; in pregnancy, 348; falling of womb, 349; tardy menstruation, 350; enlargement of neck of womb, 252; Mrs. Davis's treatment of, 352; retention of the injections, 353; astringent injections, 354; when to avoid, 355; medicinal, not used during menstruation, 356; conclusion, 357

Intestinal fluid, 56; acid in various diseases, 57

Intestines, 38; plate of, page 25; small, 39; large, 44; structure of, 50, 51; peristaltic motion of, 50; relation of to other organs, 52; magnesia, etc., collects in, 81, 82; lead balls found in, 87; egg-cup in ilium, 89

J.

Jejunum, 41

L.

Large injections, pages 110, 114; position for giving, 268

Lavements, see Injections.

Laxatives, how used in constipation, note, page 51

Laxative injections, 197

Leucorrhœa, see Vaginal Discharges, 327

“ prevails in young and old, 329

“ and whites, terms explained, 327

“ indicated by pain in left side, 331

“ climate a cause of, 332

“ in Siam, etc., 322

“ with acute inflammation, injections, etc., 355

Levatores ani, 49

Liver, situation of, 29

Lobelia inflata, remarks on, its use, etc., 226

“ relaxation peculiar to, 226

“ injection of, 227

“ “ for an infant, 229

Locked jaw, how treated, 292

Logwood injection, 202

The Numbers refer to paragraphs unless preceded by the word page.

Lumbar regions, 26

Lung fever, 221

M.

Mania, case treated by O'Beirne, 289

Menses, note, page 145

Menstruation, note, page 145

Measures, fluid, page 70

Monthly period, see Menstruation.

Mucilaginous injections, page 82

N.

Naval or umbilicus, 25

New views of defecation, 90

Nitrate of silver, injections of, 252; discoloration of the skin considered, 260; opinions of Dr. Horace Green, 261

Nitrogen, use of, in the intestinal canal, 120

Nutritive injections, 250

O.

Oatmeal gruel, injection of, 187

O'Beirne, Dr. his views of defecation, 90

Oleaginous injections, page 98

Opiate injections, 211

Opium, when to use in diarrhoea, note, page 39

Organs within female pelvis, plate of, page 139; explanation of, note, page 138

Os uteri, os tincæ or os internum, 326

Ox gall, where obtained, note, page 100

“ inspissated, how prepared, note, page 101

“ injections of, page 100

P.

Palpitation cured by hot water, 162

Pain in left side, what it indicates in woman, 331

Pancreas, note, page 30

Pancreatic juice, 64; solvent of fatty matter, 64

The Numbers refer to paragraphs unless preceded by the word page.

Pancreatic juice, office of, in digestion, 64

“ duct, note, page 24

Part I. page 13

Part II. page 63

Pelvis or basin, 1 ; plate of, page 15 ; female organs within, plate, page 139 ; brim of, 7 ; cavity of, 7, 12 ; outlet of 7 ; deformity of, 8 ; contents of, 12

Pepsin, 61

Pessaries, abuse of, note, page 149

Percussion, how performed, note, page 55

Peristaltic motion of intestines, 50

Piles, cold water injections in, 138, 320, 321 ; solution of tannin injected, 205 ; soothing injection for, 209 ; hints respecting the cure of, 320

Piston, see Plunger

Pit of stomach, 15

Placenta or afterbirth retained, 235

Pleurisy, 221

Plunger or piston, 146

“ “ washing the, 179

Pneumothorax, 110

Poupart's ligament, 19

Prolapsus ani, how treated, 206

“ uteri, explanation of, 337

Pubis or front bone, 6

Purgative injections, page 84

R.

Rectum described, 47, 48 ; pouch of, 48 ; is always open and empty, 98, 102 ; constricted above its, 92 ; relation of to other organs, 55 ; not a reservoir of the feces, 92, 102 ; impacted with feces, note, page 47 ; how treated, 175 ; irritable, elm injection, 190 ; starch, do., 193 ; anodyne do., 214 ; constriction of, influenced by spinal marrow, 288

Tube, described, 274 ; introduction of, etc., 98, 275, 283 ; repetition, etc., 298 ; tested nine years by O'Beirne, 273 ; why it should be used, 272 ; mode of using, etc., 274 - 279 ; when it should not be used, 279 ; employed by Dr. Hare in India, 281 ; introduction of, not

The Numbers refer to paragraphs unless preceded by the word page.

Rectum tube continued.

dangerous, 278 ; nor difficult, 280 ; is useful in chronic and acute dysentery, 298 ; it removes cause of fevers and inflammation, 297

Cases treated by O'Beirne with rectum tube, page 118 ; retrocedent gout, 283 ; spinal irritation, 284 ; mania, 289 ; enteritis or inflammation of intestines, 290 ; colic, 291 ; tetanus, 292 ; hysteria, 293 ; dysentery, 294 ; case, infant, 295

Rectum tube, see Rectum.

S.

Saliva encloses air, 117

Scirrhus explained, note, page 117

Scybala, described, 72

Senna, jalap, and cloves, injection of, 200

Sigmoid flexure, situation of, 32. See plate III. p. 25

“ described, 46

“ open and pervious, 102

“ may become impacted, 108

Silver, how to cleanse, 181

Soap and water injections, 185

Soothing injections, 188, 192, 208, 210

Spasms of stomach, cured by hot water, 161, 162

Sphincter ani muscle, 49

Spinal irritation, 284

Spine or back bone, B, plate IV. page 139

Spleen, situation of, 30

“ described, note, page 31

Starch injection, 192

Stays, injury from, 284

Stimulant tincture, how prepared, note, page 95

“ injection, 230, 236

Stomach, description of, 34, 35

“ plate of, page 25

“ coats of, 37

“ holds three pints, 36

“ of an infant, size of, 36

“ spasms of, cured by hot water, 161, 162

The numbers refer to paragraphs unless preceded by the word page.

Stools, see feces, 70

“ green, cause, etc., 75

“ “ not due to bile, 75

Stools, number of, daily, note, page 52

“ calls to stool disobeyed, pernicious, note, page 52

Stranguary from blisters, anodyne injection, 216

Suspended animation, injections, 133

Symphysis pubis, 6, 18 ; A, plate IV. page 139

Syringes, Improved Family or Injecting Instruments, page 68 ;
angular injecting tube not needed, 145 ; plunger or
piston, 146 ; directions for use, see Injections ; how
to cleanse, 78, 79

T.

Tannin, solution of, injections, 204

Temperature of injections, 160, 316 ; vaginal, 360

Tenesmus described, note, page 90

Tetanus, how treated, 292

Thorax, 9

Turpentine injection, 237

Tympanites or flatulence, 114

Typhoid fevers, yeast injection, 248 ; injections of nitrate of
silver, 256

U.

Umbilical region, 25

Urethra of female, F, plate IV. page 139

Urine not passed at same time as feces, 104

Uterine hemorrhage, injection for, 207

Uterus, see Womb.

V.

Vagina, described, 325 ; illustrated, K, plate IV. page 139

Vaginal discharges, see Leucorrhœa, 327

“ mucous secretion, 328

“ “ discharges or whites, 336

“ enumeration of, 333

“ watery, 334, 335

“ bloody, 337, 338

“ purulent or pus-like, 339

The Numbers refer to paragraphs unless preceded by the word page.

Vaginal discharges, so termed, from womb, 340
injections, page 138

Vomiting of fecal matter, 50 ; of bile, etc., 63

W.

Warm water injections, 183

Water-closet, remarks on, note, page 53

Weights and measures, pages 69, 70

White oak bark injection, 203

Whites, see vaginal injection, 327

“ or fluor albus, 336

Wild red raspberry, injection of, 196

Wind or flatus, 109

Wine, feather white, poisoning by, 125

Womb, described, 326

“ illustrated, L, plate IV. page 139

“ neck of, seat of disease, 352 ; note, page 145

“ falling of, explained, 324

“ “ error respecting, note, page 149

“ “ vaginal douche in, 349

“ retroversion of, explained, 324

“ engorged, cold water injections in, 322

“ discharges from, 340

“ how to inject when diseased, 342

“ hydatids of, 334

“ cauliflower excrescence of, 335

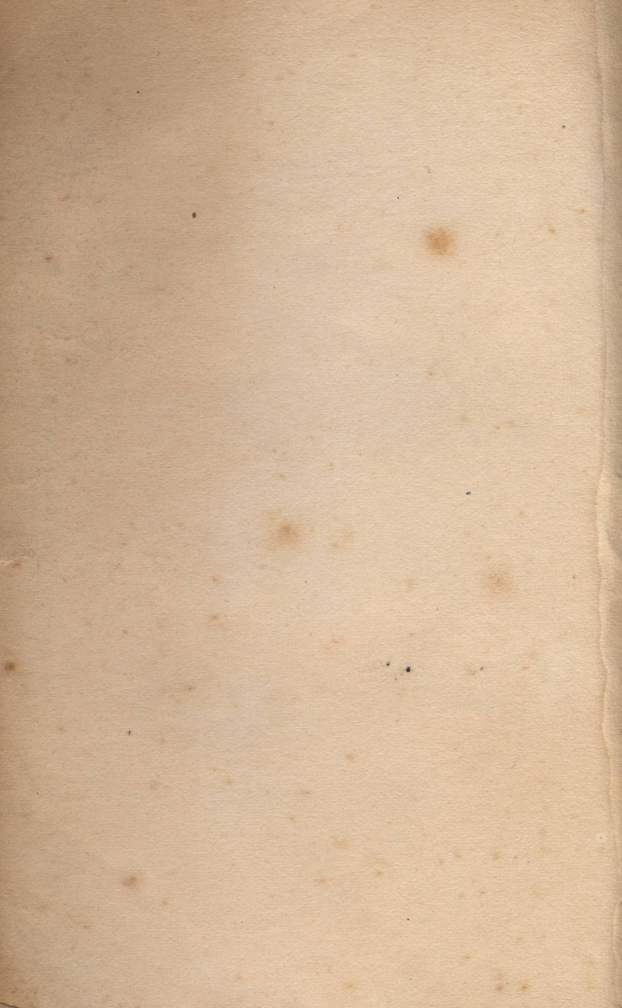
“ bleeding from, injection, 207

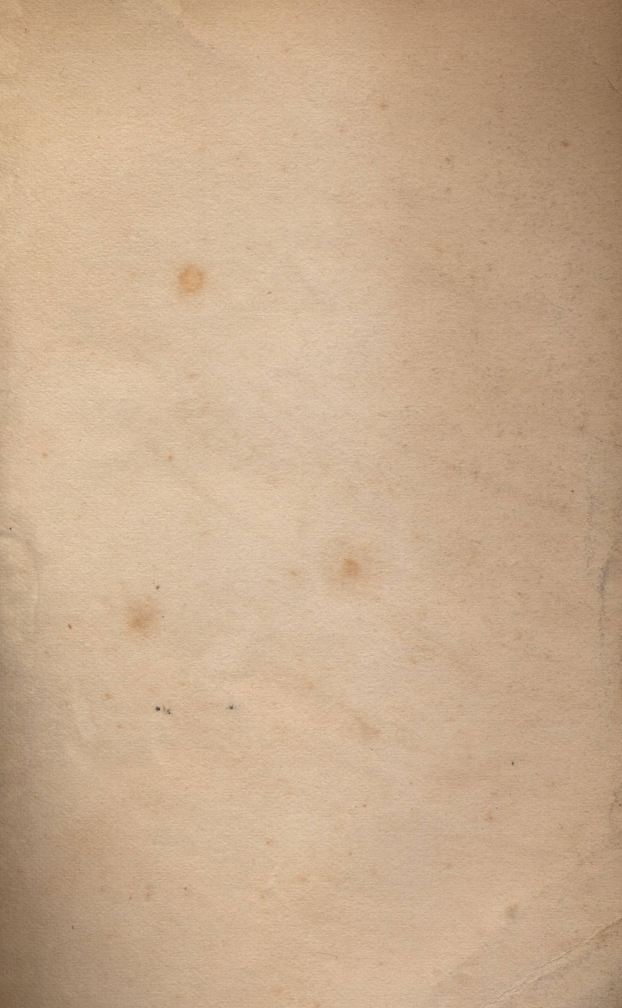
Worms, long round, and pin, 245

“ injections for, 246, 247

Y.

Yeast, injection of, 248





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